THE Practical Teacher

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Edited by JOSEPH HUGHES.

'Knowledge is proud that he has learned so much,
Wisdom is humble that he knows no more.'—COWPER.

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How to Teach School Children to Sing from Notes.

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231. Half-pulse rests are of common occurrence, especially at the beginnings of phrases of melody. When they occur at other parts of phrases, they often present difficulty. The difficulty consists in the tendency felt to sing something at the moment the beat is due or at the *shock* of the pulse, and thus it is not experienced with a rest on the second half of a pulse.

:1 . ‖
TAA *SAI*
: . 1 ‖
SAA TAI

232. Half-pulse notes followed by rests on the second halves of pulses have simply the effect of whole pulse notes sung *staccato*, or cut short. The rest is hardly felt as such, the attention of the ear is so completely absorbed with the short note performed as the shock of the pulse becomes due. A succession of pulses thus divided |1 . :1 . |1 . :1 . ‖ is perfectly easy to sing. The pupils have merely to be taught to sing short sharp notes exactly with the beat and then to learn the notation. The rhythm-name TAA *SAI* is really of very little use in practice. It is, however, serviceable in analysing new exercises or pieces, the answers of pupils enabling a teacher to ascertain whether or not the meaning of the notation is fully understood. In singing rhythm-names on a monotone, it is therefore well, as a rule, not to name rests that occur on the second half of a pulse. The following specimen exercises sometimes bring whole-pulse notes and half-pulse notes in sharp contrast. Pupils should be told to sing the half-pulse notes sharply and to take great care to fill out the notes not followed by a half-pulse dot.

SPECIMEN EXERCISES ON TA *SAI.*

(1)

m . m .	m . m .	r . m . f | s :—	1 . :s . | m . :d
r . :f .	m . :r .	m . m . | m . m .	r . m . f | s :—
d' . :s .	m . :d .	m . f : r . m | d :—	

(2)

d :— :r	m . : :	m :— :f	s . : :	}
l :— :s	s :r :m	s :— :f	m . : :	}
r :m . :s .	s :f :m	r :m . :s .	s :f :m .	}
d' :t :l	s :m :d	m . : :r	d :— :—	‖

233. Rests on the first-halves of pulses call for more elaborate study. The easiest use of *SAA* TAI is when it is immediately followed by a full-pulse tone : . 1 | 1 ‖ and probably the most difficult form of its use is when it occurs two or three times in succession | .1 : .1 | .1 : .1 ‖ For the present purpose it will be quite sufficient to suggest modes of practice for only the commonest uses of these effects. It is best to first give abundant practice of the *thing*, before any attempt is made to evolve execution from the notation. Thus the teacher should pattern

(1) | .1 :1 ‖

to *laa* and get the class to imitate the effect repeatedly while he beats the pulses. When easily imitated from pattern in this way, attention should be drawn to the fact that the first note comes *after* the shock of the pulse and the second note *with* the shock. Then the whole scale may be sung up and down to this rhythm.

(2)

.d :d	.r :r	.m :m	.f :f	.s :s	}
.l :l	.t :t	.d' :d'	.d' :d'	.t :t	‖

etc.

The time or rhythm-names will now afford good practice. The name *SAA* TAI having been evolved from TAA TAI (by the application of the rule that for rests S must be substituted for the consonant that would be used for a note struck of the same value and position in the pulse), the teacher and pupils should share the word thus

Teacher.	*SAA.*	:*SAA.*	|*SAA.*	:*SAA.*	‖
Pupils.		.TAI :	.TAI |	.TAI :	.TAI ‖

etc.

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then the tap of the stick will do for the *SAA* and the pupils will be fairly prepared to sing from the notation. In the specimen exercises that follow, and repeatedly in practice generally, the teacher should lightly name the rests, the pupils naming only the struck notes. As ear and voice are controlled by experience, the tap or the silent movements of the teacher's baton will take the place of the *SAAS*.

(3) *SAA*TAI followed by TAA and TAATAI.

m :m	.m :m	.d :r .m	|m .r :r
.f :f	.l :l	.d :r .m	|r .d :d

(4) Doh is F or G.

:	: .s$_1$	|m :- .r	:d .t$_1$ |l$_1$:
SAA SAA SAA			*SAA SAA*
|r :- .d	:t$_1$ .l$_1$ |s$_1$:		:d |l :- .s
		SAA SAA	
|r :	: .m	|s :- .f	:m .r |d :—
SAA SAA			

Songs should now be studied that contain illustrations of this rhythmic effect. *The Hardy Norseman* (published in many of Curwen's Song books under the title of *Our fathers were high-minded men*) is an excellent example.

234. The teaching of thirds of a pulse was partly described in sections 170-1, in connection with quick six-pulse measure. If this form of measure have been properly practised, it will now be necessary to teach only the written notation of thirds, and to practise these divisions with their common surroundings. The feature of the notation of thirds is the use of two *inverted commas* to divide the pulse into three equal sections. Take care from the first that pupils do not associate the idea of *three* commas with the three thirds.

: ‘ ‘ ‘ ‘ not : ‘ ‘ ‘ ‘

All the first exercises in thirds should avoid the use of duple divisions of the pulse (*e.g.*, TAA TAI, tafatefe, etc.) that are, as it were, in conflict with ternary divisions, and, therefore, lead to considerable difficulty. Practice should take the form of (1) exercises on the rhythm-names as written on the board

TAA TAA
taa tai tee TAA
TAA tee TAA

and pointed to by the teacher, (2) monotone ear exercise answered in the names, (3) exercises from the notation (see specimens below), sung to the names, to *laa* and in tune, (4) study of pieces in which thirds abound.

Specimen Exercises on Thirds.

The first line shows a rhythmic form to *laa:* each succeeding line shows a tune form in corresponding rhythm.

(1)

(*a*)	|l	:l .l .l|l	:l	|l .l .l:l .l .l|l .l .l:l
	TAA	taataitee	TAA	TAA	taataitee taataitee taataitee TAA
(*b*)	|m	:r .m .f|m	:d	|r .m .f:m .f .s|l .d^1 .t$_1$:d^1
(*c*)	|s	:f .m .r|m	:s	|l .t$_1$ .d^1:t$_1$ .l .s|f .m .r:d
(*d*)	|d	:t$_1$ .d .r|d	:s	|s .f .m:r .m .f|s .l .t$_1$:d^1

(2)

(*a*)	|l :- .l:l :- .l|l	:l	|l :- .l:l .l .l|l :- .l:l
(*b*)	|s :- .m:f :- .r|m	:d	|r :- .m:f .m .r|m :- .r:d
(*c*)	|m :- .s:f :- .l|s	:d^1	|l :- .s:s .f .m|f :- .t$_1$:d
(*d*)	|d :- .r:m :- .f|s	:d^1	|s :- .m:m .r .d|m :- .r:d

235. Thirds are sometimes mixed with halves in songs. If the thirds are correctly divided the halves that follow will be found difficult, the tendency being to divide the pulse unequally; and if halves are correctly divided the thirds that follow are difficult, the tendency being to crowd the ‘thirds’ into the first half of the pulse, or to give too much value to the first note.

When thirds and three-quarter and quarter divisions occur in one phrase it is not at all easy to avoid singing :l .,l || as though it were :l .- .l ||

Specimen Exercises.

Thirds and Halves mixed.

(1)

(*a*)	|l :l .l .l|l	:l	|l .l :l .l |l .l :l
(*b*)	|d :r .m .f|m	:s	|f .f :m .m |r .r :d
(*c*)	|s :f .m .r|d	:m	|s .s :l .l |t .t :d^1
(*d*)	|m :r .d .t$_1$|d	:d	|t$_1$ .t$_1$:d .d |r .r :m

(2)

(*a*)	|l :l .l .l|l .l	:l	|l .l :l .l |l .l .l:l
(*b*)	|d :d .d .d|m .m	:s	|s .s :l .l |s .l .t:d^1
(*c*)	|m :s .s .s|d .d	:m	|d .d :f .m |r .m .f:m
(*d*)	|d :m .m .m|s .s	:d	|m .m :r .d |t$_1$ .d .r:d

These tune forms are written to be sung as three-part rounds.

Thirds and Three-quarter and Quarter Divisions mixed.

Doh is B♭. ‘O'er the Mountain.’ *Franz Abt.*

:s$_1$.,fe$_1$	|l$_1$	:s$_1$	:d .,r	|d	:t$_1$	:s$_1$.,fe$_1$	|l$_1$	:s$_1$	:r .,m
|d	:—	:s$_1$.,fe$_1$	|l$_1$	:s$_1$	:s$_1$ .d .m	|s	:f	:m .,r
|d .,t$_1$	:r	:s$_1$	|m	:—	:s$_1$.,fe$_1$	|l$_1$	:s$_1$	:s$_1$ .d .m
|s	:f	:m .,r	|d .t$_1$ .r	:f	:t$_1$	|d	:—	

(For words and three-part arrangement, see ‘The First Nightingale.’ J. Curwen and Sons).

236. The rhythm |1 :-.1 :1 ‖ in quick time, beating once for three printed pulses, is sometimes not easy to fit in correctly. The rhythm-name, when well-known, is of great assistance. It is derived as follows :—

TAA (whole pulse)	|1 :1 .1 :1 ‖
taa tai tee (thirds)	taa te fe tee
tafa tefe tifi (thirds divided or sixths)	|1 :- .1 :1 ‖ TAA - fe tee

the three printed pulses being regarded as one pulse tripletted with the second third divided. The syllables for the second third divided are as shown above, viz., tefe, and as only the last syllable is required the word TAIfetee provides a struck consonant for each struck note, and in other ways accurately names the rhythmic effect. The well-known tune

Bonnie Dundee.

:s, | d :-.d:d | d :-.r:m | r :-.t,:s, | s, :— :s, }

TAA fe tee TAA fe tee TAA fe tee TAA tee

| r :-.r:r | r :m :f | f :m :m | m :m : etc.

TAA fe tee taa tai tee &c.

provides a good illustration of the effect, and serves to secure a proper pronunciation of the word TAAfetee.

DIVISION IV.—SONG TEST.

CODE REQUIREMENT.—*To sing in good time, tune and expression, and in a pleasing quality of tone a school song in two or more parts or round (set to words). Five songs to be prepared.*

237. Plans for beginning part singing were described in sections 122 to 124. It will be observed that great emphasis is laid upon artistic execution. There should be *good* time, *good* tune, *good* expression, and a *pleasing* quality of tone. Success in these matters depends upon the culture of the teacher, and upon the choice of good practicable music. To secure good tune and to avoid flattering, the teacher must be everlastingly vigilant. Deep breathing, voice exercises to *koo* and *kaa* (see sections 70—71), constant repression of bad voices, careful classification into treble and alto, a good pattern, and the selection of diatonic music are the weapons with which to fight that greatest enemy of good school singing, bad intonation. As to expression, it is best to aim at broad effects. Abrupt and exaggerated changes to and from *forte* and *piano* are not what is meant by expression. Let the expression show thought for the general bearing of the words, and for the character of the music. There should be a feeling of refinement in the performance that shows no labour for effects. Much has already been said in these lessons as to the choice of music for schools. It is only necessary to add that in this division of the school the greatest care should be exercised to teach only thoroughly good music. Among the numerous suggestions made from time to time by musicians and others who are not favourably impressed with the kind of music in use in schools, there is the plea of Professor Stanford for the systematic introduction of popular national melodies or folk songs that have survived the process of natural selection. There is much to be said for this proposal, for the collection of beautiful old melodies made by Mr. Stanford, and published in his *Song Book for Schools*,* shows that it is practicable to some extent to find suitable school music from this source; but it would be a questionable gain if the folk songs crushed out entirely the numerous modern school pieces that afford good training and culture to thousands of young choristers. The range of the melodies and the subject of the words unfit a very large number of folk songs for school use. At most, therefore, such music should form only a part of the year's practice.

* Published in both notations by the National Society.

238. This lesson is the last to be given in explanation of teaching school children by the Tonic Sol-fa method and Notation. The Code requirements close with the following *nota bene :*

It is hoped that the relation between the Tonic Sol-fa and the Staff Notations will be taught to scholars in Standard V. and upwards.

With a view to assist in the realisation of this hope a series of lessons on the Staff Notation will be commenced in the *March* number of this journal.

—o—

Quarterly Arithmetical Tests.

BY JOSEPH WOLLMAN,

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STANDARD I.—FIRST QUARTER.

1.	2.	4.
316	845	A boy had 98 marbles, and he lost 36. How many had he left?
58	314	
470		
94	3. 637	
23	402	

SECOND QUARTER.

1.	2.	4.
81	597	In a school there are 245 boys, 186 girls, and 278 infants How many children are there in the school?
537	348	
205		
6	3. 708	
940	555	

THIRD QUARTER.

1.	2.	4.
675	422	John had one hundred nuts, and he gave away two dozen. How many had he left?
93	325	
862		
19	3. 540	
354	273	

STANDARD II.—FIRST QUARTER.

1. 56 + 382 + 4,706 + 28,935 + 6,097 + 814 + 73.

2. Take 18,634 from 45,023.

3. Multiply 56,789 by 46.

4. In what year will a boy born in 1885 be 29 years old?

SECOND QUARTER.

1. How many half-dozen are there in 42,390? Write the answer in words.

2. From 92,045 take 82,537.

3. 19,076 × 508.

4. A dealer bought 45 dozen pigs. He sold 198 to one person and 206 to another. How many had he left?

THIRD QUARTER.

1. Multiply 47,319 by 917.

2. Divide twenty thousand and ten by eight.

3. What is the difference between 98,098 and one hundred thousand?

4. Divide the product of 9,084 and 38 by twelve.

STANDARD III.—FIRST QUARTER.

1. 12,673 ÷ 29.

2. If the divisor is 708 and dividend four hundred and sixty thousand two hundred, what is the quotient?

3. Divide a million by four hundred and sixty.

4. At an election 4,976 voted for one candidate, and 1,389 more for the other candidate. How many persons voted altogether?

SECOND QUARTER.

1. Find the difference between £10,523 2s. 7¾d. and £8c9 13s. 8½d.

2. £85 10s. 4¾d. + £6,007 13s. 9½d. + £4 17s. 6¾d. + 19s. 10d. + £93 14s. 7¼d. + £8 18s. 5½d.

3. At a school treat 1,911 nuts were divided amongst 39 children. How many did three of them get?

4. What had I left out of a £5 note after spending a guinea, half-a-guinea, a crown, half-a-crown, and 17 pence?

THIRD QUARTER.

1. Add together £6 17s. 11¼d., £1,805 14s. 9¾d., £52,094 12s. 8½d., £938 16s. 5¾d., £7,640 19s. 3¼d. and 15 guineas.

2. A boy saved 40 pennies, 30 sixpences, and 18 shillings. How much more did he want to make £2?

3. Take £8,006 19s. 7¾d. from £78,006 0s. 0½d.

4. A man gave three girls 2s. 8d. each, and four boys 1s. 9d. each. How much more did the girls get than the boys?

STANDARD IV.—FIRST QUARTER.

1. Divide £685 12s. 4¾d. by 689.

2. £93 6s. 1½d. × 86.

3. Multiply 15s. 7¾d. by 357.

4. What sum of money can a person spend daily who has an income of £800 annually, and wishes to save £97 7s. 6d.?

SECOND QUARTER.

1. Reduce 13 tons 15 cwt. 107 lbs. to half-lbs.

2. A horse and carriage cost £90, and the carriage cost four times as much as the horse. What was the cost of the carriage?

3. How many half-guineas are worth 5,649 half-crowns?

4. A dealer bought 298 articles at £1 15s. each, and sold them at 2½ guineas each. What was his total gain?

THIRD QUARTER.

1. How many seconds are there in the first four months of a leap year?

2. How many tons of iron would be required to make 53,760 nails, if eight nails weigh a pound?

3. A grocer bought 700 dozen eggs at 8½d. per dozen. He found 60 were broken, and he sold the remainder at 6 for 5d. How much did he gain?

4. How many trees can be planted in a garden 1 acre 14 poles in area, allowing 14½ square yards for each tree?

STANDARD V.—FIRST QUARTER.

1. A dealer bought 2,395 horses at £18 17s. 3d. each, and sold them at £25 12s. 6d. each. Find, by practice, his total gain.

2. What is the value of 5 tons 15 cwt. 1 qr. 17½ lbs. at £32 13s. 4d. per ton?

3. Find the rent of 7,085½ acres at £3 17s. 8½d. per acre.

4. What is the cost of 9 dozen silver spoons, each spoon weighing 1 oz. 16 dwts. 18 grs., at 5s. an ounce?

SECOND QUARTER.

1. If 15-carriages carry 540 passengers, how many will be required for 1,044 passengers?

2. If a bankrupt paid 11s. 9d. in the pound, what did a creditor lose on a debt of £3,090 10s.? (Work by practice.)

3. How long will it take 14 men to build a wall, if 30 men can do it in 10½ days?

4. Make out a bill for the following articles and receipt it:—5¾ lbs. of tea at 3s. 10d. per lb.; 11 oz. of spices at 2s. per lb.; 200 eggs at 9d. per dozen; 150 lemons at 1s. 6d. per score; 375 oranges at 5s. per hundred.

THIRD QUARTER.

1. Take $\frac{5}{8}$ from the sum of $\frac{7}{10}$ and $\frac{3}{5}$.

2. Simplify:—$(\frac{7}{8} - \frac{7}{10}) - (\frac{3}{8} - \frac{5}{7})$.

3. If 26 chests of tea, each containing 3 qrs. 13 lbs., cost £220 13s. 6d., find the cost of 15 chests, each containing 3 qrs. 19 lbs.

4. The sum of 2s. 3d. was divided among three boys. The first received a third of the money, and the second a fourth of the remainder. How much did the third boy get?

STANDARD VI.—FIRST QUARTER.

1. Simplify:—$\dfrac{(\frac{1}{3} + \frac{1}{6}) \times (\frac{1}{7} - \frac{1}{8})}{\frac{1}{9} \div \frac{1}{10}}$.

2. Add together the sum, difference, and product of ·029 and ·37.

3. Reduce ·8349 to a vulgar fraction, and divide it by $18\frac{5}{9}$.

4. Simplify:—$\{(3{\cdot}625 - 2{\cdot}75) \times {\cdot}4375\} \div {\cdot}25$.

SECOND QUARTER.

1. Find the value of $\frac{6}{7}$ of half a guinea + $\frac{3}{5}$ of $\frac{4}{5}$ of half-a-sovereign + $\frac{1}{4}$ of $\frac{1}{3}$ of half-a-crown, and reduce the result to the decimal of a sovereign.

2. Find the value decimally of 29 tons 19 cwt. at £17·84375 per ton.

3. A boy had a number of marbles. After losing $\frac{3}{5}$ of them, and then $\frac{3}{5}$ of the remainder, he had 24 left. How many had he at first?

4. Reduce $\frac{5}{6}$ of $3\frac{1}{2}$ square poles to the decimal of $1\frac{1}{4}$ acres.

THIRD QUARTER.

1. If 15 lamps are required for a road $1\frac{1}{2}$ furlongs long, how many will be required for 4 miles 198 yards?

2. What will be the amount of £490 7s. 6d. for $2\frac{1}{2}$ years at $5\frac{1}{2}$ per cent.?

3. A gentleman, after paying a tax of 6d. in the pound and another tax of 4d. in the pound, had £684 12s. 8d. left. What was his income?

4. What sum of money will produce £504 17s. as amount in 3 years at $3\frac{1}{4}$ per cent.?

STANDARD VII.—FIRST QUARTER.

1. If 18 men working 8 hours a day can reap 360 acres in 5 days, how many men will it take to reap 540 acres in 9 days working 10 hours a day?

2. If ·58$\dot{3}$ of a sum of money is £1 6s. 3d., what will be the value of ·$\dot{5}$ of the sum?

3. If 27 tons are carried 50 miles for £2 15s., what weight will be carried $\frac{3}{4}$ of the distance for $\frac{2}{3}$ of the money?

4. What is the interest on £780 for 250 days at $4\frac{1}{4}$ per cent.?

SECOND QUARTER.

1. A farmer sold 7 horses at $18\frac{1}{2}$ guineas each, 7 more at £20 15s. each, and 7 more at 19 guineas each. What was the average price?

2. In what time will £326 13s. 4d. amount to £408 2s. 7d. at $4\frac{3}{4}$ per cent.?

3. If 7 gallons of spirits at 25s. a gallon are mixed with 9 gallons at 24s. a gallon, how much water must be added to make the price of the mixture 23s. a gallon?

4. A and B can do a piece of work in 6 days, A and C in 8 days, and B and C in 10 days. In what time would they do it working together?

THIRD QUARTER.

1. If penny newspapers are bought at 8d. a dozen, and 13 are given to the dozen, what is the gain per cent.?

2. What is the rate per cent. when £345 makes £54 6s. 9d. interest in $4\frac{1}{2}$ years?

3. A builder sold a house for £560, and thereby gained $16\frac{2}{3}$ per cent. How much did he gain?

4. A ton of soap cost £28; for how much must 24 lbs. be sold to realise a profit of $12\frac{1}{2}$ per cent.?

ANSWERS.

STANDARD I.

	FIRST.	SECOND.	THIRD.
1.	961.	1,760.	2,003.
2.	531.	249.	97
3.	235.	153.	267
4.	62 marbles.	709 children.	76 nuts.

STANDARD II.

	FIRST.	SECOND.	THIRD.
1.	41,063.	7,065.	43,391,523.
2.	26,389.	9,508.	2,501 + 2.
3.	2,612,294.	9,690,608.	1,902.
4.	1,914.	136 pigs.	28,766.

STANDARD III.

	FIRST.	SECOND.	THIRD.
1.	437.	£9,713 8s. 11½d.	£62,502 16s. 2½d.
2.	650.	£6,201 14s. 7½d.	3s. 8d.
3.	2,173 + 420.	147 nuts.	£69,999 0s. 4½d.
4.	11,341 persons.	£2 19s. 7d.	1s.

STANDARD IV.

	FIRST.	SECOND.
1.	19s. 10¾d. + 200 q.	61,814 half-lbs.
2.	£8,024 6s. 9d.	£72.
3.	£279 5s. 6¾d.	1,345 half-guineas.
4.	£1 18s. 6d.	£260 15s.

THIRD.

1. 435,600 sec.
2. 3 tons.
3. £4 3s. 4d.
4. 363 trees.

STANDARD V.—FIRST.

1. £16,196 3s. 9d.
2. £188 9s. 11½d.
3. £27,530 2s. 4¾d.
4. £49 12s. 3d.

SECOND.

1. 29 carriages.
2. £1,815 13s. 4½d.
3. 22½ days.
4. £1 2s. 0½d. + 1s. 4½d. + 12s. 6d. + 11s. 3d. + 18s. 9d. = £3 5s. 11d.

THIRD.

1. $\frac{29}{1760}$.
2. $\frac{47}{880}$.
3. £135 3s. 9d.
4. 1s. 1½d.

STANDARD VI.

	FIRST.	SECOND.	THIRD.
1.	$\frac{88}{880}$.	·610416.	329 lamps.
2.	·75073.	£534 8s. 4½d.	£557 16s. 0½d.
3.	$\frac{8}{160}$.	150 marbles.	£714 8s.
4.	1·53125.	·0109375.	£460.

STANDARD VII.

	FIRST.	SECOND.	THIRD.
1.	12 men.	£20 0s. 10d.	62½ per cent.
2.	£1 5s.	5¼ years.	3½ per cent.
3.	24 tons.	1 gallon.	£80.
4.	£22 14s. 1⅞d.	1 $\frac{3}{17}$ days.	6s. 9d.

Practical Kindergarten Lessons for English Elementary Schools.

BY MRS. MORTIMER.

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XII.

GIFT VII.—*continued.*

EXAMPLES OF LESSONS.—TABLETS.

3. *The Equilateral triangle* (Plates XXV. and XXVI.).

This should be compared with the right angled triangle. The children will see that although a triangle it is different to the one they have used. The right angled triangle has two edges of the same length and one longer. This new triangle has all its edges of the same length. The angles should then be compared, the children already know that the Isosceles triangle has one right and two acute angles, they will now examine this triangle and discover that it has three angles all alike, all acute. The children should be led to notice that on which ever side the tablet is placed it always looks the same. Does the isosceles triangle? No, it has only one base line. The children to be told that because this triangle has three equal sides it is called an 'Equilateral' triangle. Exercises with these tablets should follow as with the right angled triangle, first with one, then with two, three, &c., &c.

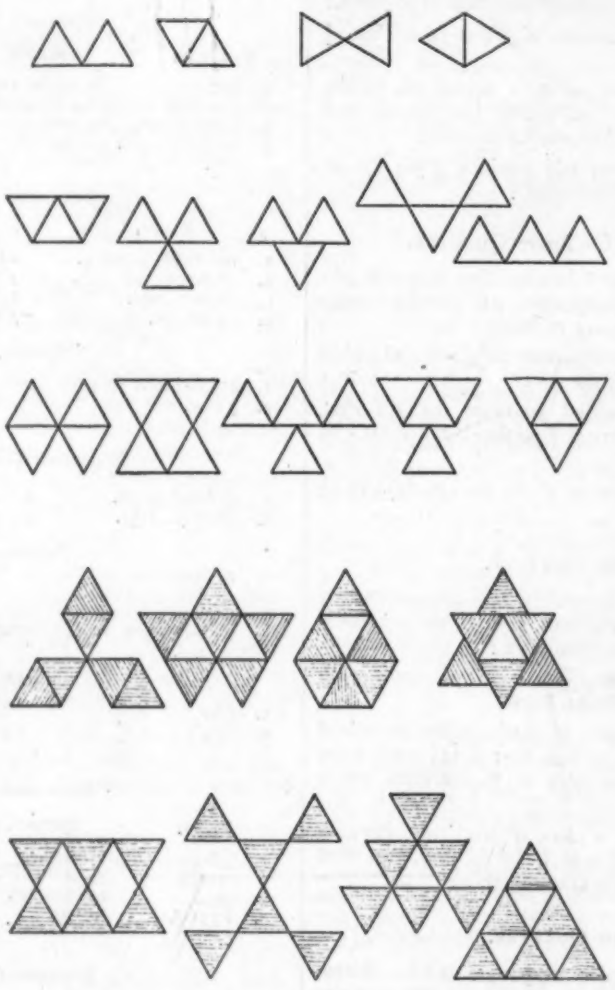


Plate XXV.

4. *The right angled Scalene triangle* (Plates XXVII. and XXVIII.).

The third kind of triangle is the right angled scalene triangle, or the right angled unequal sided triangle. This triangle is really developed from the oblong. When shown to the children they will see that it is a triangle, though different to the two they have already seen. It is like the first because it has a right angle and two acute angles, but it is unlike because all its sides are unequal. They should join two together when they will discover the oblong divided into halves by the slanting line just as the square was divided to get the right angled isosceles triangles. The whole and the half should be compared. Exercises with these tablets should follow as with others.

5. *Obtuse angled triangle* (Plate XXIX).

The fourth set of triangles is the obtuse angled triangle.

This should be examined and compared with former ones. The children will discover that one of its angles is different to any they have seen in the other triangles, it is much larger, it is called an obtuse or blunt angle. The other two angles are acute. Two edges are of the same length, the other, the base line, is longer. All these facts will soon be discovered by the children. They should then be allowed to use the tablets for laying the different forms of Life, Knowledge and Beauty. Although many forms of life can be constructed with these tablets, those made with the preceding ones are much more exact. The forms of beauty are numerous and varied.

Teachers will find it advisable to use the different tablets in combination, and as the tablets are all made on the same scale they are well adapted for this purpose. Owing to the different colours of the tablets, the colour on the one side of the tablet forming a contrast with the one on the other, the forms of beauty present pleasing arrangements, and at the same time a tasteful combination of colours is acquired. This

gift is particularly valuable in teaching the children geometrical forms. The child becomes quite familiar with the square, the different triangles, the rhombus, the rhomboid, the trapezoid, and the hexagon. He learns to distinguish the different angles, and such lines as vertical, horizontal, oblique, parallel, and the diagonal. These tablets might with great advantage be used in the Senior Department. Teachers would find that the geometrical forms would be more easily and thoroughly learnt by means of these tablets.

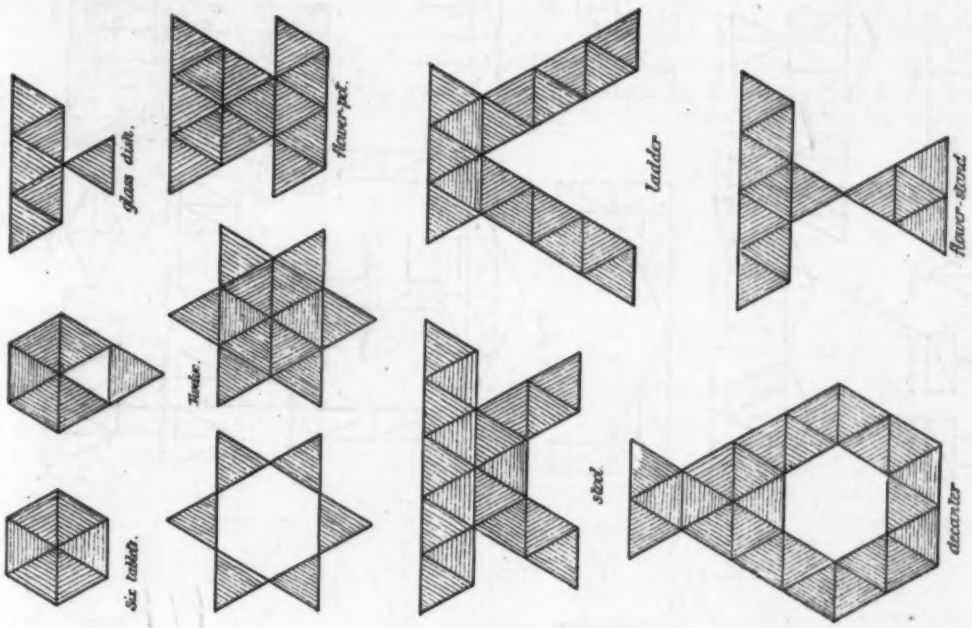


Plate XXVI.

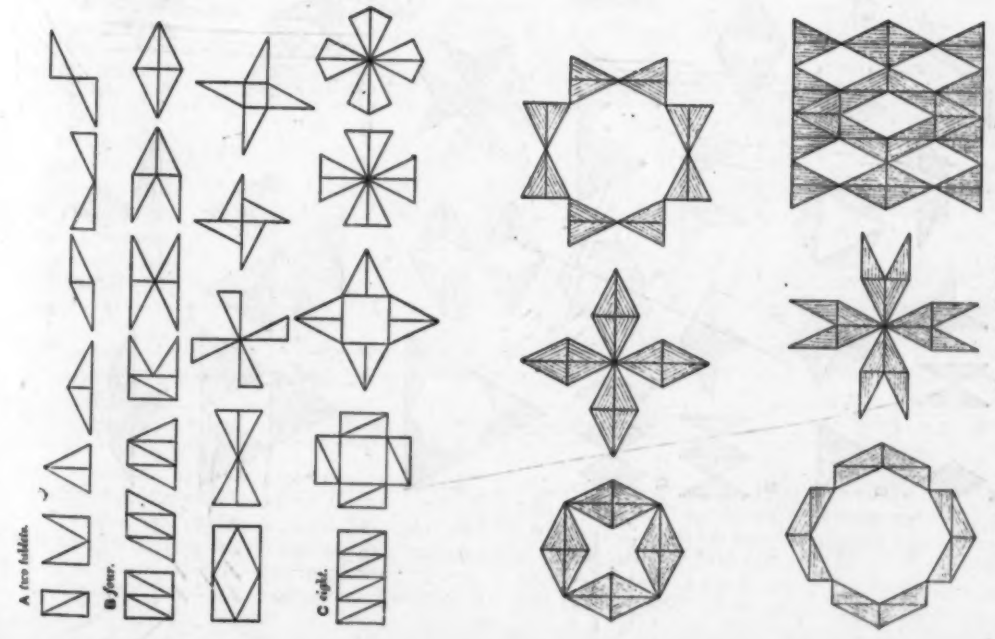
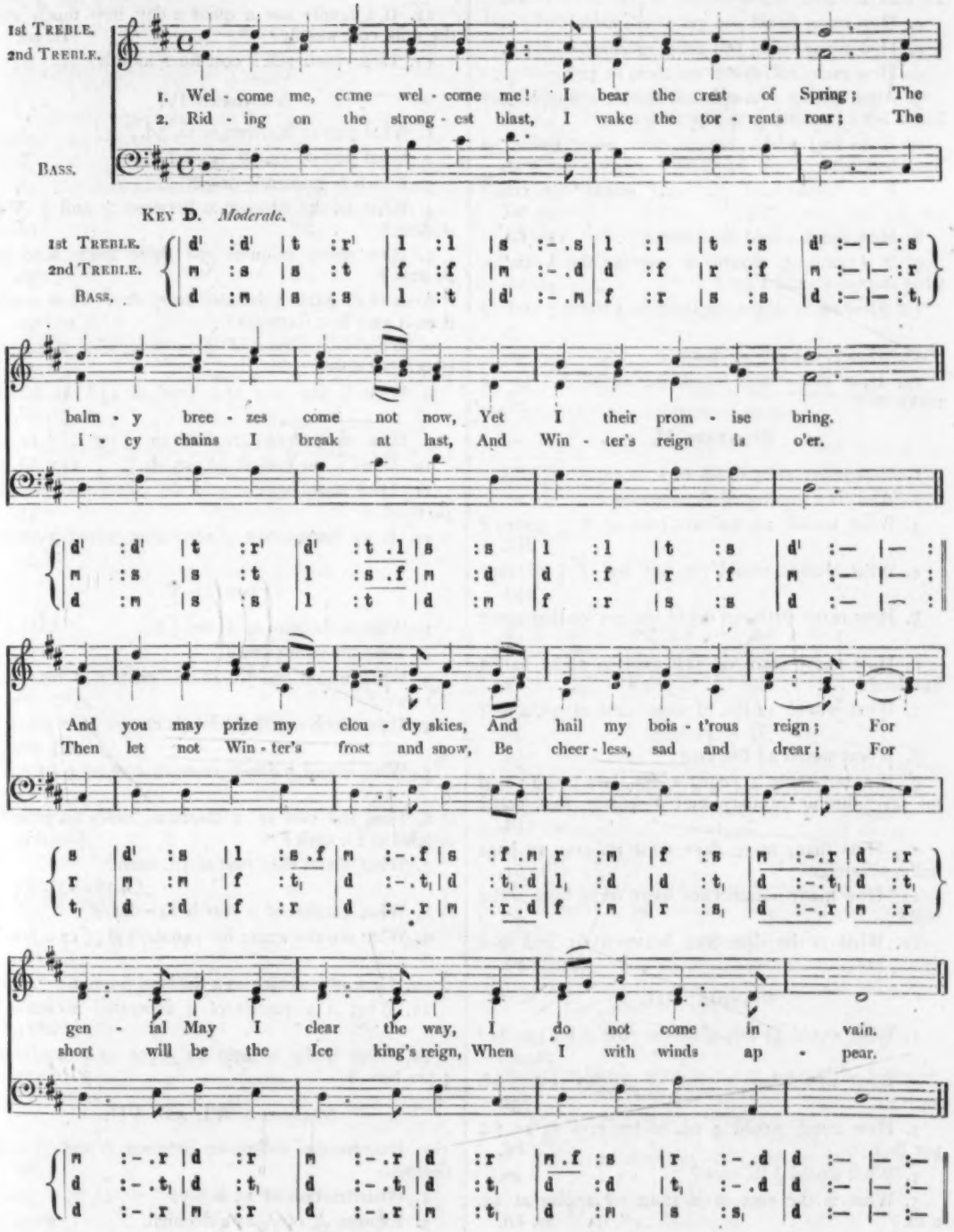


Plate XXVII.

Plate XXVIII.

Fate XXIX.

MARCH.

Moderate. *Tune*:—'THE COBBLER'S JIG.' *From Playford's Collection*, 1698.

1st TREBLE.
2nd TREBLE.
BASS.
1. Wel - come me, come wel - come me! I bear the crest of Spring; The
2. Rid - ing on the strong - est blast, I wake the tor - rents roar; The
KEY D. *Moderate.*
1st TREBLE.
2nd TREBLE.
BASS.
balm - y bree - zes come not now, Yet I their prom - ise bring.
i - cy chains I break at last, And Win - ter's reign is o'er.
And you may prize my clou - dy skies, And hail my bois - t'rous reign; For
Then let not Win - ter's frost and snow, Be cheer - less, sad and drear; For
gen - ial May I clear the way, I do not come in vain.
short will be the Ice king's reign, When I with winds ap - pear.

Tests in Mental Arithmetic.

STANDARD I.

1. How many penny books could you get for 1s. 6d.? 18.
2. How many could you get at 2d. each? 9.
3. How many could you get at 3d. each? 6.
4. How many half-dozen are there in 42? 7.
5. After selling 7 couple of ducks, a shopkeeper had 6 left; how many had he at first? 20.
6. If he had sold 9 couple, how many would he have had left? 2.
7. If a couple cost 7s., what would one cost? 3s. 6d.
8. How much would three cost? 10s. 6d.
9. If I gave 3 crowns to pay for the 3 ducks, what change should I get? 4s. 6d.
10. How many dozen are there in 5 times 7 and 1? 3.
11. How many are $2\frac{1}{2}$ dozen? 30.
12. How many tens must be added to 30 to make 80? 5.

STANDARD II.

1. How many are 5 times 16? 80.
2. What is a quarter of that number? 20.
3. What would 20 walnuts cost at 8 a penny? $2\frac{1}{2}$d.
4. What change would you get out of a shilling? $9\frac{1}{2}$d.
5. How many farthings could you get for that sum? 38.
6. How many more do you want to make half a hundred? 12.
7. What would 12 lbs. of sugar cost at 3d. a lb.? 3s.
8. Wheat would $2\frac{1}{2}$ lbs. cost? $7\frac{1}{2}$d.
9. If a boy saves a penny a day, how much could he save during January and February this year? 4s. 11d.
10. How many more days must he save to have half-a-sovereign? 61.
11. How many minutes are there in an hour and a half? 90.
12. What is the difference between 61 and 90? 29.

STANDARD III.

1. What would $3\frac{1}{4}$ lbs. of cheese cost at 8d. per lb.? 2s. 2d.
2. What would half a gross of articles cost at $\frac{1}{2}$d. each? 3s.
3. How much would 4 oz. of tea cost at 2s. 8d. per lb.? 8d.
4. What would $\frac{3}{4}$ lb. cost? 2s.
5. What is the cost of a stone of apples at 3d. a lb.? 3s. 6d.
6. What would a stone and a half cost? 5s. 3d.
7. How many minutes are there from 2 to 5 p.m.? 180.
8. How many yards are there in $\frac{1}{4}$ mile? 440.
9. How many more are wanted to make half a thousand? 60.
10. If a pint of milk cost $1\frac{1}{2}$d., what will a gallon cost? 1s.
11. If a family use a quart a day, how much will the milk cost weekly? 1s. 9d.
12. How much will it cost for a month? 7s.

STANDARD IV.

1. What part of a crown is 1s. 3d.? $\frac{1}{4}$.
2. What part of 1s. 3d. is 5d.? $\frac{1}{3}$.
3. Which is greater, $\frac{1}{3}$ or $\frac{1}{4}$? $\frac{1}{3}$.
4. What is the difference between $\frac{1}{3}$ and $\frac{1}{4}$ of a shilling? 1d.
5. How many minutes are there from 8.30 to 11 a.m.? 150.
6. A clock gains 5 minutes every day. How much does it gain in a fortnight? 1 hr. 10 min.
7. What is the cost of $\frac{1}{2}$ gross articles at half-a-crown per dozen? 15s.
8. What is the cost of a yard at $1\frac{1}{4}$d. an inch? 3s. 9d.
9. How many stones are there in $2\frac{1}{2}$ cwt.? 20.
10. What is the cost at $\frac{1}{2}$d. per lb.? 11s. 8d.
11. How many eggs at 5 for 6d. could you get for 4s. 6d.? 45.
12. If 12 horses cost £200, what would 3 cost? £50.

STANDARD V.

1. What is the sum of $\frac{1}{2}$ and $\frac{1}{3}$? $\frac{5}{6}$.
2. Take the sum from 2. $1\frac{1}{6}$.
3. What would 72 lbs. of tea cost, if 8 lbs. cost £1 10s.? £13 10s.
4. How much would 3 bushels cost at 3s. a gallon? £3 12s.
5. What would 5 dozen oranges cost at 3 for 2d.? 3s. 4d.
6. Find the cost of a thousand times a thousand articles at 1s. each? £50,000.
7. What would they cost at 1d. each? £4,166 13s. 4d.
8. What fraction of a year is 146 days? $\frac{2}{5}$.
9. What are the wages for 146 days at £12 a year? £4 16s.
10. How is $\frac{1}{4}$ written as a decimal fraction? ·25.
11. What is a quarter of $\frac{1}{4}$ expressed decimally? ·0625.
12. What is the interest on £550 for 9 months at 4 per cent.? £16 10s.

STANDARDS VI. AND VII.

1. Express the difference between $\frac{1}{2}$ and $\frac{13}{20}$ as a decimal. ·65.
2. What fraction of 13 is ·65? $\frac{1}{20}$.
3. Express $\frac{1}{20}$ of $\frac{1}{20}$ as a decimal. ·0025.
4. What is the value of ·54 of a pole in yards? 3.

5. What sum will amount to £600 in 4 years at 5 per cent.? £500.

6. How long would it take to amount to £800? 12 years.

7. If it takes only 8 years to amount to that sum, what is the rate per cent? $7\frac{1}{2}$ per cent.

8. What is the average of a shilling, sixpence, threepence, and a penny? $5\frac{1}{2}$d.

9. What percentage is 2s. 6d. in the £? $12\frac{1}{2}$ per cent.

10. What percentage of 3 tons is 5 cwt.? $8\frac{1}{3}$ per cent.

11. If an article be sold for half-a sovereign at a loss of 20 per cent., what was the cost price? 12s. 6d.

12. If it had been sold at the same price, but at a gain of 20 per cent., what would have been the cost price? 8s. 4d.

—o—

How a Scotch School was Examined.

Music Tests.

1. *Modulator.*—Key C. m s d' s l se l t d' m f r fe s l t r' d' 'd t_1 r f m 'se f e l s &c.

2. *Ear Exercise on Harmonium.*—(1) d m r d; (2) s l s m; (3) f l s d; (4) d' s m l; (5) r t_1 m d.

3. Test in singing at sight for Standards under V.

Key B♭.

s_1 :—	m_1 : s_1	d :—	— :
d : d.d	d : m.r		
d : s_1	m_1 : s_1	d : d.d	d : m.r
d : —	— :		

4. Test in sight-singing for higher Standards:—

Key C.

s :-.l : s	m :— :—	s :-.l : s	m :— :—
m :-.f : m	d :— :—	m :-.f : m	d :— :—
r' :— : r'.t	t :— :—	d' :— : d'.s	s :— :—
f :— : f.r	r :— :—	m :— : m	m :— :—
l :— : l	d :-.t : l	s :-.l : s	m :— :—
f :— : f	l :-.s : f	m :-.f : m	d :— :—
l :— : l	d' :— : t.l	s :-.l : s	m :— :—
f :— : f	l :— : s.f	m :-.f : m	d :— :—
r' : r' : r'	f' :-.r' : t	d' :— :—	m' :— :—
f : f : f	r :-.f : r	m :— :—	s :— :—
d' :-.s : m	s :-.f : r	d :— :—	— :— :—
m :-.m : d	m :-.r : t_1	d :- :—	— :— :—

Infant Classes.

Reading.—A short sentence or a line was read by every one, and simple questions were given to test the intelligence of even the youngest.

Writing.—Highest class wrote their names, the others wrote the capitals S C O T L A N D, and small letters e d i n b u r g h, these being dictated by the Inspector.

Arithmetic.—The more advanced scholars added on slates 22 + 12 + 15 + 14, and answered such numbers as 9 and 9? 8 and 7? 7 and 10? 11 and 5? &c. 4 from 11? 7 from 14? 8 from 12? 9 from 16? &c.

The younger ones answered easier questions in a similar manner.

In singing, a simple modulator exercise of the following style was given:—

d m s d' d' s m d r f l t d t l s m r f d &c.

Standard I.

Reading.—One half of class read from Chambers' Graduated and the other from Star Reader. Simple questions on words or phrases were given, and a pupil teacher gave them a lesson on nouns.

Writing.—Alternate children wrote line A or B:—

A. 'There are many things to do at the seaside.'

B. 'We can sail boats and wade or look for shells.'

Arithmetic—

A. 1. 888 + 770 + 909 + 91 + 9.
2. From 734 take 25.
3. From 870 take 690.

B. 1. 749 + 808 + 880 + 89 + 19.
2. From 736 take 87.
3. From 960 take 750.

Standard II.

Reading.—The girls read from Chambers' Graduated and the boys from Nelson's Star Reader. Questions were asked on the matter read, and the grammar of nouns, verbs and adjectives being professed was tested by the Inspector.

Writing.—The copy books were asked for, and each pupil showed the best written page at the Inspector's request.

Dictation.—'Not far from the church stood a sundial. And on this day, when the sun was hiding his face, the clock began to talk.'

Arithmetic.—

A. (1) 9,870 + 839 + 9,271 + 739 + 8,399 + 991 + 9,099 (words).
(2) From 371,509 take 127,639 (figures).
(3) Multiply 50,683 by 6 (figures).

B. (1) 8,795 + 6,247 + 5,058 + 869 + 5,407 + 64.
(2) From 7,080 take 6,979.
(3) Multiply 7,896 by 6.
(All in words.)

STANDARD III.

Reading.—The boys and girls read from the same book—Nelson's Star Reader, although they also professed Royal Scottish Reader.

One sentence of three lines or so sufficed for a pass, but any hesitation on the part of the reader led to a longer test.

Grammar and analysis were taken from the passage read, and the parsing of the noun as to its gender, number and case, pleased the examiner.

Writing.—Copy books were not required. The following passage was dictated by the teacher:—

'The creature, however, soon showed itself to be a great thief; and when the hunters left their huts, it would often steal in and make off with any fruit or fish that it could find. For this it was whipped several times, but it never learned to be honest.'

Arithmetic.—

(1) Take 34,057 from 36,002 (words).
(2) Multiply 910,463 by 8,007 (words).
(3) Divide 2,567,846 by 758 (words).
(4) Add £66 17s. 8¼d., £271 4s. 9½d., £5 15s. 10d., £7,382 11s. 4¾d.
(1) Take 7,029 from 33,005 (words).
(2) Multiply 48,067 by 3,905 (words).
(3) Divide 28,131,180 by 385.
(4) Add £73 16s. 8½d., £410 2s. 11d., £8 18s. 4¾d., £7,336 16s. 1d., £22 14s. 10¾d.

History.—Robert Bruce—his titles before he became King—his dealings with Edward I. and Comyn—Battle of Methven—his relatives—his wanderings—events in Arran—in Ayrshire—Loudon Hill—Battle of Bannockburn.

Mary Queen of Scots—her parents—childhood—departure for France, and life there—her return to Scotland—Knox—Darnley—Rizzio—Ruthven—imprisonment in England—her execution.

Geography.—Boundaries—character of west coast—openings on east—groups of islands—principal islands in each group—island counties—counties on east and south of Aberdeen—counties on Solway F.—rivers flowing into Solway—four largest rivers—mountain peaks of the Grampians—peaks north of Caledonian Canal—capital, and a number of the principal towns with the rivers on which they were situated.

Repetition.—'Battle of Hohenlinden' and 'Casabianca'—a few lines were taken from each, and a very few meanings of words and phrases were asked.

STANDARD IV.

Reading.—All read from Star Reader—the lesson being 'An Adventure with a Shark.' After everyone had read a sentence or two the following meanings were asked:—'Lay at anchor,' 'gentle breeze,' 'sultry,' 'sundown,' 'the hands,' 'laughing mood,' 'urging,' &c.

Grammar and Analysis.—Analyse: 'Half-an-hour before sundown, the captain gave the cheering order.' Parse 'hour,' 'sundown,' 'gave,' 'order.' A few other sentences and words from the same lesson and of the same pattern were taken, and the class questioned, partly individually and partly simultaneously.

Dictation.—'He was a little drummer-boy of ten years old, whose fresh, rosy face looked very bright and pretty among the grim, scarred countenances of the old soldiers. When the cutting wind whirled a shower of snow in his face, he dashed it away with a cheery laugh, and awoke the echoes with the lively rattle of his drum, till it seemed as if the huge black rocks around were all singing in chorus.'

Arithmetic.—

A. (1) Multiply £135 6s. 7½d. by three thousand and five.
(2) Divide £17,001 15s. 7¾d. by 195.
(3) One yard cost £1 7s. 1½d.; what is the price of thirty yards?
(4) Reduce 172,980 ozs. to cwts.

B. (1) Divide £1,300 14s. 3½d. by one hundred and nine.
(2) Multiply £72 16s. 7¾d. by seven thovsand and fifty.
(3) Reduce 50,318 sixpences to threepences.
(4) How many miles are there in 17,296 feet (1,760 yds. = 1 ml.)?

Geography.—Great Britain—how separated from Ireland—islands in Irish Sea—in Bristol Channel—Capes on south coast of England—rivers of England running south—mountains south of the Thames—mountains of Wales—source and course of the Severn—of Thames—rivers flowing east. Ireland—course of Shannon lakes on its course—mountains of Cork and Kerry—islands on west coast of Ireland, &c.

History.—James II.—Whom he married—character—attempts to make England Roman Catholic—cause of appeal to William of Orange—landing of the Prince—flight of James—events of William's reign. *Anne*—husband and family—Scotland—War of Spanish Succession.

Repetition.—Lines were taken from Sir Walter Scott's 'Lady of the Lake.' A few lines were repeated by each, and meanings of words and phrases were very sparingly asked.

STANDARD V.

Reading.—The lesson read was 'A Dutch Paradise,' from the Star Reader.

Some time was spent after examining the reading in questioning on the geography of Holland and the character of the Dutch.

Analysis.—'It must not be omitted to mention that this village is the paradise of cows as well as of men.'

Parsing.—'Must be omitted,' 'that,' 'paradise,' 'as well as.'

Writing.—

A Cure for Lameness.

'A menagerie was erected in a field near a country town. Early next morning a report was spread that a young tiger had escaped from his cage. By the road-side was daily laid a man who had lost the use of his legs. For many years he had lived upon pennies dropped by sympathising people who passed that way, Suddenly a great shout was heard in the distance. A crowd of terrified school-children, men, and women came rushing pell-mell down the road in the direction where the helpless cripple lay. As soon as they came near crying out, "The tiger, the tiger," the use of the cripple's legs seemed to be suddenly restored; starting up like a deer, he threw away his stool, and darted off as fast as his legs could carry him. The tiger was soon captured, but the cripple was never again seen in that part of the district.'

Arithmetic.—Sample Card.

(1) Find by Practice the value of 749½ articles at £3 17s. 10½d. each.

(2) Make out and receipt the following bill:—
27½ yards calico at 2s. 3d. per yard.
7 gross buttons at 1s. 3d. per dozen.
144 bobbins at ½d. each,
60 yards ribbon at 5s. 3d. a yard.

(3) If 60 fires burn 2 tons 5 cwts. of coal in a month, how many cwts. will 15 fires burn in the same time?

(4) Divide $1\frac{1}{2} + 3\frac{1}{4}$ by $3\frac{1}{4} - 1\frac{1}{2}$.

Geography.—Draw (A) a map of Spain (B) a map of Italy, and C. a map of Scandinavia.

Questions asked on Russia; physically and politically.—Chief rivers of Europe, source, course and the seas or oceans they entered.

Australia and Canada came in for a fair share of questions.

History.—Beginning with the Seven Years' War, questions were given in chronological order, till the close of the American War of Independence.

Repetition.—'The Battle of Flodden,' beginning with 'And why stands Scotland idly now.'

As usual each one repeated a few lines, and at the close the Inspector tested the pupils on the scene of the battle and the persons alluded to in the lines.

STANDARD VI.

Reading.—The same reading as Standard V., the Grammar and Analysis being somewhat more difficult. Questions were asked on the meaning of Simple, Complex, and Compound sentences.

Writing.—An essay on 'Mountains,' 'Bread' or 'Storms.'

Arithmetic.—Sample Card.

(1) If 2 tons 5 cwt. be carried 50 miles for 16s. 3d. how far should 17 tons 15 cwt. be carried for twice the money?

(2) Divide ·01575 by 1·25 and multiply the result by ·0035.

(3) Reduce $\frac{5}{7}$ of £3½ to the fraction of $\frac{4}{9}$ of 9 guineas.

(4) Find the amount of £375 6s. 8d. for 5 years at 3 per cent.

Geography.—Draw a map of (A) India, (B) South America, (C) Australia.

Questions were asked on Africa—rivers—mountains—lakes—explorers—and British possessions generally.

History.—The examination was almost wholly confined to the constitutional changes during the present reign.

Repetition.—The lines were from the same poem as Standard V. and taken at the same time.

Registers were tested—both Daily and General—from names in examination schedule.

Sewing.—The girls were arranged according to Standards and worked as per Schedule 3.

Model Answers to Pupil Teacher Examination Papers.

OCTOBER, 1889.

END OF SECOND YEAR.

History.

BOYS AND GIRLS.

(*Answer three of these questions.*)

1. Give the dates of the *Constitutions of Clarendon*, *Magna Charta*, and the *Provisions of Oxford*; with the circumstances under which they were agreed to. State the principal provisions of any *one* of them.

2. Describe shortly the relations between England and Scotland in the reigns of Edward I., Henry VIII., and Elizabeth.

3. What connection do you trace between the Black Death, the statute of Labourers, and Wat Tyler's rebellion?

4. What claim did Henry VII. prefer to the throne? What difficulties did he have to contend against? With what purpose did he establish the Star Chamber?

5. What was the policy of Elizabeth with respect to religion? Who were the Puritans? Point out clearly in what way the presence of Mary Queen of Scots in England was a danger to the peace of the kingdom.

(1) *a.* Constitutions of Clarendon 1164 A.D.

b. Magna Charta 1215 A.D.

c. Provisions of Oxford 1258 A.D.

a. The constitutions enacted that clergy accused of any crime should be tried by civil judges, that no chief tenant of the crown should be excommunicated, or his lands put under an interdict; that bishops should be regarded as barons, and should be subjected to the burdens belonging to that rank; that no person of rank including clergymen, should leave the realm without licence; that appeals should be made to the king, and not to the pope; that clergy should not enforce rights obtained through oaths or promise.

(2) *Edward I.* Margaret, heiress to the Scottish crown, having died, there were several claimants to the throne; Robert Bruce and John Baliol being the chief. Edward arbitrated in favour of Baliol. He afterwards revolted, and Edward's forces defeated him at Dunbar 1296, the coronation stone being carried to England. Under Wallace the English were defeated at Stirling 1297, but were victorious at Falkirk 1298.

Henry VIII. Henry having joined Austria and Spain against France, James IV. of Scotland came to the help of France by invading England. He was defeated and slain at Flodden Field 1513.

Elizabeth. A regency under Murray had confined Mary Queen of Scots in Lochleven Castle. She escaped, fought and lost the battle of Langside 1568, and fled to England, where she was imprisoned. Several plots under the Duke of Norfolk and Babington failed to release her. Convicted of implication in these plots, Mary was condemned and beheaded 1587.

(3) The Black Death it is estimated swept away one third of the population. The consequence was labourers were very scarce, landlords excused their tenants their rents for fear of losing their labour, and the process of the commutation of labour rents for money payments was hastened. The serfs were practically emancipated. The king issued a proclamation that no higher rate of wages than customary should be paid on pain of a heavy penalty. The proclamation was disobeyed. On the assembling of Parliament the proclamation was embodied in an Act called the 'Statute of Labourers.' The landlords everywhere complained that this statute was not kept, and they determined to reduce the labourers to the position of serfs again. Stirred up by the poor priests, the poor people rose in a body, and the incident of the insult to Wat Tyler's daughter was made the occasion of the general rising of the peasantry.

(4) Henry VII. first intended to settle the quarrel between himself and Richard III., of the House of York. When he was crowned at Bosworth, he was in doubt as to the grounds on which he should base his title to the throne. At first he reigned by right of possession of the crown, then he brought all the reasons together to support his claim—the throne was his by right of conquest, by right of descent from John of Gaunt, and after his marriage, because he had united the rival claims of York and Lancaster into one.

He had to contend against insurrection; first, against Lord Lovel (1486) in the north, then against the rising under Simnel, aided by the Duchess of Burgundy and the people of Ireland (1487), and then that of Warbeck personating the Duke of York, brother to Edward V.

Henry instituted the Star Chamber for the purpose of punishing offences against the State more swiftly than by the ordinary processes of law.

(5) Elizabeth's accession was the occasion for the re-establishment of the Protestant religion, and the Acts of Uniformity and Supremacy were immediately passed. Elizabeth severed herself from the Papacy by refusing to acknowledge the claim of the Pope to decide upon her right to the throne. She had not, however, any sympathy with the forms of thought and belief of the Puritans, nor would she permit them to set up any order or society of their own. During her reign, therefore, Elizabeth steered a middle course between Roman Catholicism and Puritanism.

The Puritans were those persons of the reigns of Henry VIII. and Elizabeth, and following reigns, who wished a form of worship much more thoroughly purified from the errors of the Church of Rome than was the case after those sovereigns had broken away from the supremacy of the Church of Rome. They believed also in a purer form of life and manners, and eventually became Nonconformists and Dissenters.

So long as Mary Queen of Scots was in England, it gave a pretext to all who were her friends, either in England or Scotland, to conspire in her favour, and was thus a standing menace to the sovereignty of Elizabeth and the peace of the kingdom.

Teaching.

BOYS AND GIRLS.

(*Answer two questions only.*)

1. Make some mental exercises on *money*, suited for the First and Second Standards, and let them be as varied in form as possible.

2. It is said that some children know their reading-books almost by heart, and that when examined they are only reciting and not reading. How could you detect this fault, and by what means could you guard against it?

3. What is the use of *tracing* in the earlier copy-book exercises; and what are the objections, if any, to the practice?

(1) How many farthings in a penny? In a halfpenny? In 6d.? In 4d.? Take 2½d. from 3d. (Addition and substraction of various sums, including losing, finding, buying, selling, giving, lending). Gave away 3½d, and had 2½d. left, how much at first? Bought a loaf for 7d., change out of 1s.? Gave 3d. to John, had 6d., and lost 1½d., how much left? Had 5s., lent 2s. 6d., how much remains for my use? Boys' wages 8d. a day, how much for a week? How much a day would 5s. a week be?

(2) The fault could be detected by paying heed to the reader. Children supposed to know their reading books by heart make little slips, mis-calling prepositions and other little words, leaving out words, and occasionally looking away from the book while reading. To guard against the fault, pointing to each word may sometimes be resorted to, occasional reading backwards may be asked for, the teacher should sometimes point to particular words, and the best means is to read as far as possible unknown lessons.

(3) To accustom the learner to the shapes and slopes of letters, and to show the various thicknesses of the strokes. There are no objections to the moderate use of tracing exercises. If mixed with lines where tracing is not needed, so as to give a feeling of independence, the use is altogether beneficial.

END OF THIRD YEAR.

English Grammar and Composition.

BOYS AND GIRLS.

(*Answer questions* 1 *and* 2, *and one other only.*)

1. Paraphrase this passage:—

'The King is come *to marshal* us, all in his armour *drest*,
And he *has bound* a snow-white plume upon his gallant crest.
He looked upon his people, and a tear was in his eye;
He looked upon the traitors, and his glance *was stern* and high.
Right graciously he smiled on us, as rolled from wing to wing
Down all our line a deafening shout, 'God save our Lord the King';
And *if my Standard Bearer* fall, as fall *full well* he *may*,
For never saw I promise yet of such a bloody fray,
Press *where* ye see my white plume shine, amidst the ranks of war,
And be your oriflamme to-day the helmet of Navarre.'

—MACAULAY.

2. Parse the words printed in italic, and analyse the last four lines.

3. Explain the meaning and use of the syllables printed in italic, in each of the following words:—

*Sub*terranean. *Inter*-dependence. Priest*hood*. Critici*se*. First*ling*. Silk*en*. Longi*tude*. *For*bid. *Ante*date. *Dis*simi*lar*. *Post*script.

4. Mention any terminations which show that certain words are of Latin derivation; and give some examples.

5. Write a short compound sentence, containing in it—(*a*) an adjective sentence; (*b*) a noun sentence; and (*c*) an adverbial sentence; and explain how you distinguish them.

(1). The king has arrived for the purpose of arranging the order of battle. He is clothed in armour, his helmet being adorned with a snow-white plume. As he looked upon his friends who might fall upon the battle field, his eyes filled with tears, but when he turned his face to the enemy, his look betokened anger and severity. As he rode along the ranks, loud shouts of 'God save the king' arose from every throat, pleasure filling his breast the while. Then he turned to his soldiers and said, 'The day promises to be a bloody one, and it may happen that my standard bearer may be killed. If he does, and you are in doubt what to do, look for my white plume, which will be found in the thickest of the fight, and let my helmet take the place of the banner which should lead you in the fight to-day.

(1)

To—a particle, the sign of the infinitive mood.
to marshal—reg. trans. verb, act., infin, pres., gov., by 'come' or 'in order' und.
drest.—past part. of 'to dress,' referring to 'king.'
has—aux. verb to 'bound' indicating perf. tense.
bound—past part. of 'to bind,' referring to 'he.'
has bound—verb, irreg., trans., act., ind., perf., 3rd, sing., agreeing with 'he.'
was—verb, irreg., intrans., act., ind., past, 3rd, sing., agreeing with 'glance.'
stern—adj. of quality, qualg. 'glance.'
right—adv. of degree, qualg. 'graciously.'
if—cop. conj., joining the two sents., 'if my Standard Bearer fall,' and 'Press.'
my—pers. pro., masc. gender, sing., 1st, poss., gov. by 'Standard Bearer.'
Standard Bearer—com. noun used as proper, masc., sing., nom. to 'fall.'
full—adv., of deg., mod. 'well.'
well—adv. of man., qual. 'may fall.'
may—aux. to 'fall' indicating pot. mood.
where—adv. conj. 'joining two sents.' 'Press' and 'Ye see my &c.'

(*a*) And press amidst the rank of war. [Princ. Sent.]
Connec.—And.
Subj.—[You.]
Pred.—press.
Ext. of Pred.—amidst the ranks of War.

(*b*) If my Standard Bearer fall. [Adv. Sent. of cond. to *a*.]
Connec.—if.
Subj.—my Standard Bearer.
Pred.—fall.

(*c*) As fall full well he may. [Adv. Sent. of man. to *b*.]
Connec.—As.
Subj.—he.
Pred.—may fall.
Ext. of Pred.—full well (manner).

(*d*) For never saw I promise yet of such a bloody fray. [Adv. Sent. of reason to *c*.]
Connec.—For.
Subj.—I.
Pred.—saw.
Obj.—province of such a bloody fray.
Ext. of Pred.—never yet.

(*e*) Where ye may see my white plume shine. [Adv. Sent. of place to *a*.]
Connec.—Where.
Subj.—ye.
Pred.—may see.
Obj.—my white plume to shine.

(*f*) And be your oriflamme to-day the helmet of Navarre. [Princ. Sent. co-ord. with *a*.]
Connec.—And.
Subj.—[you].
Pred.—[let].
Obj.—your oriflamme be the helmet of Navarre.
Ext. of Pred.—to-day.

(3)

Sub—prefix, meaning under.
inter—prefix, meaning among or upon.
hood—affix, meaning state or condition, forming abstract noun.
ise—affix, signifying *to do*, forming verb.
ling—affix, meaning little, forms noun.
en—affix, signifying made of, forming adj.
tude—affix, signifying state, forms abstract noun.
ante—prefix, before.
for—prefix, the contrary.
dis—prefix, different.
ar—affix, forming adj., meaning like.
post—prefix, signifying after.

(4)

ant, ent, assistant, agent.
ate, legate; *ess*, governess.
iff, caitiff; *mony*, ceremony.
trix, executrix; *ure*, juncture.
al, legal; *ant*, distant.
ate, private; *ple*, triple; *fic*, terrific.
fy, magnify; *ish*, finish; *esce*, coalesce.

(5) When the clock struck four, the lads, who had hitherto been very still, shouted 'Now is the time.'

Adv. sent. When the clock struck four. It tells the time of the shouting, and is used as an adverb.
Adj. sent. Who had hitherto been very still. It is an adj. sent. because it describes the boys.
Noun sent. 'Now is the time.' It takes the place of a noun as the object. of the trans. verb shouted.

Geography.

BOYS AND GIRLS.

(*Answer three questions only.*)

1. (*a*) Draw a map of the Mediterranean Sea; (*b*) or the Pacific Coast of Asia.

2. Where are the following places, and for what reasons are they commercially or politically important: Zanzibar, Herat, Port Said, Delagoa Bay, Mauritius, Yokohama, Batavia, Lagos, Suakin.

3. What Asiatic rivers flow into the (*a*) Sea of Aral; (*b*) Persian Gulf; (*c*) Arctic Ocean.

4. Give some account of the commercial and political position of Afghanistan and Japan.

5. Name some of the principal ocean currents and constant winds, and explain their causes in the cases of the Gulf Stream and the Monsoons.

(2) *Zanzibar*, island and province on east coast of Africa; the seaward termination of main route into the interior; exports coffee, sugar, spices, ivory and indigo.

Herat, frontier town, well fortified, north of Afghanistan, the key to the possession of the country from the north.

Port Said, entrance to Suez Canal, on Mediterranean; principal coaling station for vessels passing through the canal.

Delagoa Bay, an inlet on east coast of Africa, 250 miles north of Natal; a good position for obtaining African trade.

Mauritius, a valuable island east of Madagascar; exports sugar.

Yokohama, chief port of Japan; on east coast of Niphon.

Batavia, the capital, on north-west coast of Java; a good situation for foreign trade.

Lagos, on slave coast, west coast of Africa, forms part of Gold Coast Colony; exports palm oil and ivory.

Suakin, on an island in Red Sea, coast of Nubia, good harbour; great place of embarkation for Mecca pilgrims; good port for entrance to Nubia.

(3) *Sea of Aral:* Sir Daria and Oxus. *Persian Gulf:* Euphrates and Tigris. *Arctic Ocean:* Obi, Yenisei, Lena, Kolima, and Indigirka.

(4) *Afghanistan.*—The manufactures of the country consist chiefly of home-made fabrics of silk, cotton, and wool. Madder, fruits, tobacco, furs, and shawls are exported.

The various tribes are ruled by Khans or Chiefs, these being themselves subject to the Ameer or King. The people are hostile to foreigners, and rebellion and intrigue among themselves are very frequent.

Japan.—Since 1860 Japan has been open to foreigners, and trade has quietly increased; ivory carvings, pottery, and lacquer ware are exported; minerals are abundant, rice, wheat, barley, tea, cotton, and sugar are grown. The Mikado is the chief ruler, acting through a ministry formed after the European model.

(5) The chief currents of the Atlantic are the equatorial current, dividing into the Brazil current and the Gulf Stream, the Arctic current, and the South Atlantic current.

In the Pacific, the Equatorial which divides on reaching the coast of Asia and Australia, the Black current of Japan, and the Polar currents.

In the Indian Ocean, the Equatorial, which becomes the Mozambique current.

The principal constant winds are the trade winds and the monsoons and the land and sea breezes of warm countries.

The Gulf Stream is the name acquired by the Equatorial current after it has entered the Gulf of Mexico. The heated and expanded water of the tropics forms the Equatorial current, and this forced through the narrow opening of the Strait of Florida becomes the Gulf Stream. The monsoons are caused by the rarefaction of the air on the continents of Asia and Africa at different seasons of the year. They are the trade winds of the Indian Ocean modified by the overheating of these continents.

History.

BOYS AND GIRLS.

(Answer three questions only.)

1. What were the principal provisions of the Petition of Right, the Bill of Rights, and the Union with Scotland? State the leading causes of the deposition of James II.

2. Under what circumstances did the following places come into the possession of England:—Jamaica, Gibraltar, New York, Cape of Good Hope, Malta?

3. What events are connected with Monk, Clive; The Boyne, Utrecht, the Khyber Pass, Torres Vedras; 1745, 1759, 1805, 1857?

4. Write notes upon the following:—'Thorough,' 'Pride's Purge,' and these lines:—

> 'When Chatham's language was his mother tongue,
> And Wolfe's great name compatriot with his own.'

5. What legislation has been passed during the present reign with regard to India?

(1) The *Petition of Right* complained of—

(1) Forced loans and benevolences;
(2) Taxes imposed without the consent of Parliament;
(3) The billeting of soldiers upon private individuals;
(4) Arbitrary imprisonments;
(5) Martial law.

It asked for no new liberties, but for the maintenance of the liberties and privileges of the people as contained in Magna Charta.

The *Bill of Rights* (1689) declared, without the consent of Parliament, the illegality of suspending or dispensing with laws, the levying of taxes, and the maintenance of a standing army in time of peace.

It insisted upon the right of subjects to petition the king, free elections of members of parliament, freedom of debate, and frequent sessions, and the impartial return of jurors. It also excluded Papists from the throne, and gave it, in the event of William III. and Mary being without issue, to Anne.

The *Union with Scotland* (1707) gave the whole country the name of Great Britain. It vested the succession in the House of Hanover, provided for one parliament to which Scotland should send sixteen peers and forty-five commoners; both nations were to have freedom of trade, the Scotch were to retain their religion and civil laws, and the national flag was to be a combination of the two.

James endeavoured to dispense with the provisions of Acts of Parliament. He issued a Declaration of Indulgence, established and attended Catholic worship, gave dispensations to clerical converts to Rome from the Act of Uniformity, appointed Catholics as heads of houses in both universities, and to offices in the army, and generally attempted to re-establish the Catholic religion. He issued a second Declaration of Indulgence, and imprisoned the seven bishops who refused to read it in their churches. This led to a crisis, and on the birth of a son to James negotiations were entered into with William Prince of Orange to come and defend the Protestant religion, and the rights and liberties of the people of England.

(2) *Jamaica* was taken from the Spaniards during the Commonwealth by Penn and Venables (1658).

Gibraltar was taken by Sir G. Rooke in 1704, and continued in the possession of Britain by the Treaty of Utrecht in 1713.

New York. Acquired under the Treaty of Breda (1667) ceded by Holland.

Cape Colony. The Treaty of Paris (1814) terminated the second war of the French Revolution. By it England acquired Cape Colony and other possessions.

Malta, as Cape Colony.

(3) *Monk.* Commanded the army in Scotland in the Commonwealth, and brought about the restoration of Charles II. (1660).

Clive. Foundation of the British Empire in India; battles of Arcot and Plassey (1725–1774).

Boyne. Victory of William III. over James II. (1689).

Utrecht. Treaty which ended the War of the Spanish Succession (1713). Gave England Hudson's Bay, Nova Scotia, Newfoundland, and Gibraltar.

Khyber Pass. Massacre of British troops, 1842 (Jan.).

Torres Vedras. Formation of lines of defence by Wellington, in 1810.

1745: Rebellion in Scotland in favour of Prince Charles Edward Stewart.
1759: Capture of Quebec by Wolfe.
1805: Death of Nelson, at Trafalgar.
1857: Indian Mutiny.

(4) '*Thorough*' was the watchword of Wentworth, Earl of Strafford, whose purpose was that of vindicating the monarchy for ever from the conditions and restraints of its subjects. He put in practice his motto of 'Thorough' in his government of Ireland in 1633.

'*Pride's Purge.*' The Parliament had for some time been in treaty with Charles I., and had accepted his concessions as a basis for treaty, rejecting the petition of the officers of the army against the arrangements with Charles. Colonel Pride, therefore, seized 52 of the members, and shut out 160 others, the rest reversing the decision previously arrived at. This riddance of the House of Commons of all but the independent party was called 'Pride's Purge.'

While Chatham was using his powers as a speaker for the good of his country in the Parliament at home, Wolfe was fighting the battles of the country against the French in Canada.

(5) The principal legislation connected with India during the present reign was that which transferred the government from the East India Company to that of the Queen in 1858, and that which gave to the Queen the title of Empress of India in 1875.

Teaching.

BOYS AND GIRLS.

(Answer two questions only.)

1. Write out full notes of a lesson on *one* of these subjects:—

(1.) A cotton mill.
(2.) Wheat, and its uses.
(3.) The parts of a sentence. (First lesson in analysis.)
(4.) *For Infants.* Snow and Rain.

2. Explain fully, as to a class of beginners, the method of long division, and work out the following question, so as to show the meaning and value of each figure in the answer:—

Divide £23,782 10s. 6d. by 17.

3. (*a*) Write out in detail a lesson on *Lakes*, showing how they are formed, in what sort of country, and how they look.

or (*b*) *For Infants.* Give the heads of a lesson on the three principal colours, and say what objects, pictures, or apparatus you would need to make such a lesson interesting and useful.

(1) 1. *Introduction.* Call attention to various articles made of cotton, and introduce the subject of the manufacture. Place required—A mill.

2. *The Building.* In some districts (Lancashire) children would be very familiar with the sight. Others would need explanation. Long, broad, high building of five, six, or more stories, well lighted on all sides, and top rooms from roof.

3. *Contents.* Filled with machinery of various kinds for the different processes. Ground floor: Looms for weaving. First floor: Machines for carding or combing the cotton and preparing it for the spinners. Other floors: Spinning machines spinning different kinds of thread, some for the warp, others for the woof. Upper floors used for preparing the warps in various ways.

4. *The Machinery.* Pictures must be here shown, verbal description being insufficient and unsuitable. Show loom, carding machine, and spinning machine.

5. *The Working of the Mill.* Outside the building show the boilers and engines, show connection between the engines and the shafting carrying the pulleys by which all the machines are worked.

6. *The people employed in the Mill.* Notice the crowds of people needed, firemen, enginemen, carders, spinners, winders, dressers, weavers, and others.

7. *Lessons from a Visit to a Cotton Mill.* The use of vegetable products, the skill of Inventors, the necessity for care, quickness, and activity of mind and body, may serve as subjects for lessons.

1. (4) A Lesson for a Wintry Day.

Call attention to the rain falling as the children come to school. Where from? Clouds.

Formation of Clouds. Hold wet cloth before fire, call attention to the steam. Breathe on the glass pane, notice the water forming into drops and then running down the pane. Speak of the cloud from a railway engine. What is it makes the steam from the drying clothes and the steam from the engine? Heat. Is there anything which is hot which causes the steam from the ground or water? The sun.

Formation of Rain. Clouds travel along the sky. Wind drives them near hills or trees. These are colder than the clouds, just as the pane is colder than breath. The result is formation of rain.

Formation of Snow. Cold winds freeze the vapour. Result is snow. Examine snowflakes if possible. Show that snow melts in the hand, near the fire, anywhere where there is heat.

Uses of Snow and Rain. Supply us with water for our use, for the cattle, for the fields and gardens. Snow covers up the seeds, keeps the earth warm, waters the mountains, supplies us with water for rivers in the summer.

(2) Take an easy example 688 ÷ 2.

688 = 600 + 80 + 4.

Show that 2 will divide into 600 − 300 times, into 80 − 40 times, into 8 − 4 times. Put that down as follows :—

```
2)600 + 80 + 8(300 + 40 + 4
  600
  ---
   80
   80
   --
    8
    8
    -
```

Now, let the class see that the 0's might be done away with to save time, thus :—

```
2)688(344
  6
  -
  8
  8
  -
  8
  8
  -
```

Work several examples of this kind, and proceed to examples with divisors of two and more figures :—

```
                                £    s.  d.
17)23000 + 700 + 80 + 2  10  6(1000 + 300 + 90 + 8 = £1398.
  17000
  -----
   6700
   5100
   ----
   1680
   1530
   ----
    152
    136
    ---
     16
     20
  17)330(10 + 9 = 19s.
    170
    ---
    160
    153
    ---
      7
     12
  17)90(5d.
     85
     --
      5
```

(3) (*a*) *Formation of Lakes.*—The contour of mountains is very irregular. Among them there are often great depressions. If rain or snow falls in any quantity the water does not all sink into the ground, but runs down the slopes into the low ground. Unless the ground is very porous the hollow is filled up with water, and a lake is formed. The little lakes formed thus among the bleak mountains are often called *tarns.* Here the scene is very lovely; the high hills rise bleak and bare on every side, little signs of life, vegetable, or animal are seen on every side, the wild fowl only being near. Sometimes two ranges of hills run parallel with each other, then the hollow between them may be filled with water. Many of the lakes of Scotland are of this character, as Loch Ness, Loch Tay, Loch Awe. In England, Thirlmere and Windermere are of this kind. When the hills are not high then the lake districts are most enchanting. Many are covered with trees, the streams form pretty cascades in summer-or rushing torrents in winter. Villa residences, pretty farm houses, and lovely cottages are dotted about the hill sides, and in summer, especially, the whole scene is rendered lively with the songs of birds, the bleating of sheep, and the sounds of country life.

In larger countries the valleys assume great proportions, and the lakes cover many square miles. Such is the case in North America. If the basin of a river has not much slope, and is of considerable extent, then the lake may be only shallow, and the surroundings uninteresting. The great lakes of the N.W. of America, Lakes Ladoga and Onega in Europe, Lakes Baikal and Balkash in Asia, and Lough Neagh in Ireland are examples.

(*b*) *Red.*—Show colour on colour card, then red ribbons, red cloth, red rose, red apple. Point, if possible, to red sky, red brick of walls. Ask for any other red things which children may have seen.

Blue.—Proceed in same way with this colour, having as many different objects as possible. Point to blue sky, blue slate; speak of the blue sea, and have other things of blue named.

Yellow.—An orange, a daffodil or a primrose, a cowslip should be shown, ribbons, paper and cloth.

Now have wheel of cardboard with the three radiating colours turned round quickly, and it will be seen what colours seem to disappear and only white is left.

Next, use the picture of a rainbow and a glass prism; call attention to the light which is white, and let children look through the prism and they will see the various colours, running one into another, forming other colours.

From all this children will learn that colour gives beauty to the things around us, that there are three chief colours, that these colours mixed give others, and that the light which is white is made up of all colours; also that it is only by light that there are any colours at all.

END OF FOURTH YEAR.

English Grammar and Composition.

BOYS AND GIRLS.

(*Answer Questions* 1 *and* 2, *and one other only.*)

1. Paraphrase this passage, and explain its meaning :—

'Tired Nature's sweet restorer, balmy sleep,
He, like the world, his ready visit pays
Where fortune smiles; the wretched he forsakes;
Swift on his downy pinion flies from woe
And lights on lids unsullied with a tear.
Night, sable Goddess, from her ebon throne,
In rayless majesty, now stretches forth
Her leaden sceptre o'er a slumbering world.
Silence how dead! and darkness how profound!
Nor eye, nor listening ear, an object finds;
Creation sleeps. 'Tis as the general pulse
Of life stood still, and Nature made a pause;
An awful pause! prophetic of her end.'

2. Parse and analyse the sentence :—

If it were done, when 'tis done, then 'twere well it were done quickly.

3. Select from the lines in Question 1 any words which you know by their form to be—(1) English; (2) Latin, in origin; and give the roots.

4. What is meant by the drama? Name six famous English dramatic writers, and the names of any of their works.

5. Give the plurals of any of these words—
Crisis, Automaton, Monsieur, Cherub, Madame, Formula, Genius, Die, Sow, Genus.

6. State and illustrate any rules which would help a learner to guard against mistakes in using the word 'which.'

(1) Soft, sweet sleep acts like the people of the world; it seems to visit readily those whose lives are so happy that they never have to shed a tear, but refuses to visit the wretched although they are most in need of its presence to restore their wasted powers of mind and body.

Black night as if the ruler of the time hangs over all the earth wrapped in slumber. The silence is very great, the darkness complete. Neither eye nor ear can find an object on which to rest. The whole earth is still. It is the same as if life had left the world, and the stoppage of all its concerns was a prophecy of the time when the world would actually cease to be.

(2)

(*a*) If it were done. [Adv. Sent. of condition to *c*.]
Connec.—If.
Subj.—it.
Pred.—were done.

(*b*) When it is done. [Adv. Sent. of time to *d*.]
Connec.—When.
Subj.—it.
Pred.—is done.

(*c*) Then 'twere well. [Princ. Sent.]
Subj.—it.
Pred.—were well.
Ext. of Pred.—then (time).

(*d*) It were done quickly. [Nom. Sent. in app. with *it* in *c*.]
Subj.—it.
Pred.—were done.
Ext. of Pred.—quickly (manner).
If—cop., conj., joining the sents. 'it were done' and 'it were well.'
it—pers. pro., neut., sing., 3rd, nom. to 'were.'
were—verb, irreg., intrans., aux. to 'done,' indg. pass. voice.
done—past part. of 'to do' ref. to 'it.'
were done—verb, irreg., intran., cond., past, pass., 3rd, sing., agreeing with 'it.'
when—adv., conj., joining the sent. 'it is done' and 'it were done quickly.'
it.—pers. pron., neut., sing., 3rd, nom. to 'is done.'
is—verb, aux. to 'done,' indg. pass. voice.
done—past part. of 'to do,' ref. to 'it.'
is done—verb, irreg., trans., pass. indic., 3rd, sing., agreeing with 'it.'
then—adv. of time, mod. 'were.'
it—pers. pro., neut., sing., 3rd, nom. to 'were.'
were—verb, irreg., intr., 3rd, sing., ind., form used for potential past agreeing with 'it.'
well—adv. of manner mod. 'were.'
it—pers. pro., neut., sing., 3rd, nom. to 'were done.'
were—aux. to 'done,' ind., pass. voice.
done—past part. of 'to do' ref. to 'it.'
were done—verb, irreg., trans., conditional form used for potential, 'should be done,' past, 3rd, sing., agreeing with 'it.'
quickly—adv. of man. mod. 'were done.'

(3) *English.*—Tired, sweet, sleep, he, like the world, his, ready, where, smiles, the wretched, he forsakes, swift on his downy, flies, from, woe, and, lights, on, lids, with, a, tear, night, from, her, goddess, ebon, in, now, stretches, forth, her, leaden, o'er, a, slumbering, world, how, dead, and, darkness, how, nor, eye, listening, ear, an, finds, sleeps, it, is, as the, of, life, still, made, pause, awful, of, her, end.

Latin.
Nature—*natura*.
Restorer—*re*, back; *sto*, to stand; *er*, agent.
Balmy—*balsamum*.
Visit—*video*, to see.
Pays—*pacare*, to appease.
Pinion—*penna*, a wing.
Unsullied—*un*, not; *sullius*.
Throne—*thronus*, a seat.
Rayless—*radius*; *less*, without.
Sceptre—*sceptrum*, a staff.
Silence—*sileo*, to be silent.
Profound—*pro*, forth; *fundus*, the bottom.
Object—*ob*, in the way; *jacio*, to throw.
Creation—*creo*, to fulfil.
General—*genus*, birth.
Pulse—*pello*, to drive.
Pause—*pausa*, a stoppage.
Prophetic—*prophetia*, a speaking forth.

(4). That literature which consists of compositions, which are intended to be spoken or acted on the stage, and which represent human actions as they happen in life.

Among English dramatists may be named:—
Wm. Shakespeare, who wrote 'Hamlet,' 'Macbeth,' 'Romeo and Juliet,' 'Othello,' 'Richard III.', &c., &c.
Richard Brinsley Sheridan.—'The Rivals,' 'School for Scandal,' 'The Critic.'
Sheridan Knowles.—'Virginius,' 'The Hunchback.'
Oliver Goldsmith.—'She stoops to conquer.'
Wm. Congreve.—'Double Dealer,' 'Love for Love.'
Philip Massinger.—'A new way to pay old debts.'
Ben Jonson.—'Every man in his humour,' 'The silent woman.'
Beaumont and Fletcher.—'The faithful Shepherdess,' 'The Maid's Tragedy.'

(5.) Crisis, crises; automaton, automata; monsieur, messieurs; cherub, cherubim; madame, mesdames; formula, formulæ; genius, genii, geniuses; die, dies, dice; sow, sows, swine; genus, genera.

(6.) *Who* is used of persons, *which* of animal things, and *that* of persons and things. Formerly it was the only relative used by some writers. It is now confined to nouns of the neuter gender or to the lower animals.

It would thus be incorrect to say—The man which I saw yesterday—but correct to say—'The dog which I saw was a collie.'

Speaking of a person and using the interrogative pronoun it is the same. If you expect the answer to be a person you say Who? or whom? If a thing, Which? If the pronoun is used adjectively it is used as all other adjectives, for any gender of noun.

Geography.

BOYS AND GIRLS.

(*Answer three questions only, including the 2nd and 4th.*)

1. What are exterior and interior planets? Give their names, then order of magnitude and mean distance from the sun.

2. Draw a map of the United States of America, and in addition to the main physical features, mark the position of six seaports, add six inland towns.

3. Say what you know of the political and commercial condition of two of the following states, and give the name of the most important seaport in each—(*a*) Mexico; (*b*) Argentine Republic; (*c*) Peru.

4. Where are the following, and what would ships probably bring from them to England? What do you know of the climate of each—Charlestown, Dunedin, D'Urban, Bahia, Valparaiso, Tangier, Honolulu, Hammerfest?

5. Describe as fully as you can the course of the mails from London to Shanghai viâ Brindisi.

(1) By the exterior and interior planets we mean those plants whose orbits are respectively greater or less than that of the orbit of the earth, or which are further away or nearer to the sun than the earth.

The interior planets are—

	Order of magnitude.		Mean distance.
Mercury	6	.....	33½ millions of miles.
Venus.....	5	.....	66¾ ,,

The exterior planets are—

Mars	7	.....	136¾ ,,
Jupiter	1	.....	477 ,,
Saturn	2	.....	875 ,,
Uranus	4	.....	1760 ,,
Neptune	3	.....	2855 ,,

(3) *Mexico* is a country of minerals. Gold, silver, quicksilver, copper, lead, and tin are found in abundance. The country exports cochineal, silver, beef, tallow, and hides. Its government is republican. Frequent changes have taken place during this century, and rebellions are not infrequent. The chief port is Vera Cruz.

Argentine Republic. As its name implies, has been and is still noted for its silver. Mines of gold, copper and lead are common in the north provinces. Its great wealth in the present day consists in the vast herds of cattle which are found on the pampas; cochineal, dyewoods, gums and resins are also produced and exported. The country consists of seventeen Provinces and States, each with its own governor, but federated for national purposes after the fashion of the United States. Its chief port is Buenos Ayres, the capital.

(4) *Charlestown*, in the State of South Carolina; United States of America; cotton; very hot.

Dunedin, capital of province of Otago, on Otago Harbour, S. Island, New Zealand; temperate, as in England; frequent winds; exports cotton and corn.

D'Urban, oldest town and seaport of Natal, S. E. Africa; gold, diamonds, hides; temperate and healthy.

Bahia, on All Saints' Harbour on the East coast of Brazil, with the exception of Rio, the largest city in the Empire (now Republic) of Brazil; in torrid zone, hot, but healthy; exports cotton, sugar, coffee, hides, logwood, gums, drugs, and diamonds.

Valparaiso, chief port of Chili, on West coast of S. America, 90 miles W.S.W. of Santiago; subject to earthquakes; climate hot; exports minerals, especially nitrate of soda.

Tangier, strongly fortified port of Morocco on Straits of Gibraltar; warm, dry, and healthy; exports dates, esparto grass.

Honolulu, capital of the Sandwich Islands, in Pacific Ocean, hot; exports tropical fruits, sugar, coffee, rice, pula, sandal wood.

Hammerfest, most northerly town in Norway, near the North Cape; cold; exports fish.

(5) Mails leave London via Dover, pass through Mont Cenis Tunnel through N. and E. Italy to Brindisi. Here they are shipped and forwarded through Port Said, the Suez Canal, Suez. A call is made at Aden, at Point de Galle, and at Singapore in the Straits of Malacca. The next stopping place is Hong Kong; the vessel then proceeds through the Straits of Formosa to Shanghai.

History.

BOYS AND GIRLS.

(*Answer three questions only.*)

1. Explain clearly the claim of James I. to the throne. In what way did the Church Government of England differ from that of Scotland at the time, and what did James mean by saying 'No bishop, no king!'?

2. *With what objects* were the following passed:—Triennial Act, Habeas Corpus Act, Toleration Act, Septennial Act, Reform Bill of 1832? Give dates.

3. How did the powers possessed by the Crown at the Restoration in 1660 differ from those which it possessed at the accession of Charles I.? When did these terms come into use, and what did they mean at the time:—Whig and Tory, High Church and Low Church?

4. State what you know of any three of the following statesmen:—Strafford, First Earl of Shaftesbury, Walpole, Lord North, the *younger* Pitt, Canning, Lord John Russell, Lord Beaconsfield.

5. What extension of the colonial empire of Great Britain took place in the time of George II.?

(1) James I. was the lineal descendant of Margaret, the eldest daughter of Henry VII, who had married James IV. of Scotland. Failing issue of Henry VIII, he was the nearest heir to the throne.

The Government of the Church of England was episcopalian, that is by bishops, and the service was liturgical; the government of the Scotch Church was presbyterial, and the service non-liturgical.

He meant that the maintenance of the kingdon depended upon the establishment of episcopacy, and that persistence in opposition to receive bishops was a declaration of rebellion against the king.

(2) *The Triennial Act* (1641) was passed to prevent the king attempting to govern without a parliament. Another Triennial Act was passed in 1694, providing for a *new* parliament meeting every three years.

Habeas Corpus Act (1679) was passed with the intention of protecting the liberty of the subject against the frequent violations of those portions of the charters which provided against arbitrary imprisonment.

The Toleration Act (1689), one of the earliest Acts of William and Mary, was passed to relieve Dissenters taking the oaths of Supremacy and Allegiance from the penalties incurred in the exercise of their religion.

The Septennial Act (1716) was passed to prevent the Jacobite party from coming into power under the Triennial Act of William and Mary.

Reform Bill of 1832 was passed to disfranchise a number of boroughs whose population had greatly decreased, and generally to amend the representation of the people.

Charles II. seemed to be restored to a power less fettered than that which his father had enjoyed, but the House of Commons grew steadily in strength and influence. The army was disbanded, and a fixed sum was paid to the king in return for the surrender of a large number of feudal privileges which the kings had so far retained and exercised. (Cox.)

The terms 'Whig and Tory' came into use in 1679. Shaftesbury, one of the Cabal, wished to secure the Duke of Monmouth as successor to Charles. The persons who favoured this course were called petitioners, but the party who spoke against such a scheme called them 'Whigs,' a term applied to Scotch rebels against the government. The Petitioners called the others 'Tories,' from the Irish robbers so named.

The Lower House of Convocation in the reign of Queen Anne attempted to cast reflections on the reign of William III. As this was personally offensive to the bishops, who had all been appointed by William, their conduct was resented. Great differences of opinion arose and the terms High and Low Church came into use 1703.

(4) *Strafford*, Thomas Wentworth, first earl, 1593—1641. Was at first a member of the Roundhead party, but passed over to that of the king, and became as he called it 'thorough,' or an advocate of absolute monarchy maintained by military forces. He assisted Laud, Archbishop of Canterbury, in carrying out his designs. From 1633—1640 he was deputy lieutenant in Ireland, which he reduced to submission. He was impeached by the Long Parliament, tried for high treason, condemned and executed, 1641.

First Earl of Shaftesbury, 1621—1683, was Chancellor of the Exchequer in the reign of Charles II. and a member of the Cabal. He attempted to exclude the Duke of York from succession and failing in the attempt fled to Holland, where he died.

Sir Robert Walpole, 1676—1745. He was prime minister under the first two Georges. It is said that he ruled by means of corruption, his dictum being 'Every man has his price.' The country grew rich and prosperous under his administration. A powerful coalition compelled him to resign, when he was pensioned and made Earl of Oxford.

(5) George II., 1727—1760. Georgia, colonised by charter, 1732. Canada, Nova Scotia, New Brunswick, Cape Breton Island, Prince Edward Island, Senegal, finally acquired under the treaty of Paris, 1763, but acquired by conquest during the reign of George II.

Teaching.

BOYS AND GIRLS.

(*Answer two questions only.*)

1. If you were giving a lesson on a reign—for example, that of Elizabeth or Charles I.—say what are the most important facts you would refer to and in what order you would teach them.

3. Explain with illustrations, as to the scholars of the Fifth or Sixth Standard, the difference between literal and figurative language.

3. Write out notes of a lesson on *one* of these subjects:—
(*a*). Routes across the American continent.
(*b*). Monarchies and Republics.
(*c*). *For Infants.* A farm.
(*d*). The manufacture of steel.

4. Say what—if anything—should be learned by heart, either in an Infant School, or by children in the Fourth Standard, and give your reasons.

(1) If the lesson were meant to teach all the principal facts of the reign, they should be taken in chronological order, thus—

Elizabeth. (*a*) Accession; (*b*) quarrel with the pope, leading to (*c*) quarrel with Spain, leading to (*d*) Spanish Armada; (*e*) relations with Scotland and Mary Queen of Scots; (*f*) literature and progress in the reign of Elizabeth.

(2) *Literal* language is that in which the words are used in their every day sense or meaning.

Figurative language is that in which words meaning one thing, or attached to one kind of thing, are spoken of another. When excited by grief or joy common words do not seem sufficient to express our feelings, and we then used words drawn from outside sources to describe them. For example:—

Literal: His spear was long and thick.
Figurative: His spear was like the mast of a ship.
Literal: He fought bravely.
Figurative: He was like a lion in the fight.

Eastern nations were fond of figurative language. Instead of saying that God would protect the righteous, David said, 'The name of the Lord is a strong tower; the righteous runneth into it, and is safe.'

(3) *Kinds of Government.*—Ask for names of European countries, and the kind of government each has. Answers of empires, kingdoms, and republics will probably be obtained. If not, they can be drawn from the words emperor, king, and president which the children would give. First speak of

Monarchies: Give the derivation of the word, *monos*, alone, *archē*, government, and then get the meaning—government by one. Show how the one-man government is modified by parliaments or similar assemblies with other names; explain limited monarchy as compared with absolute monarchy; and give examples from European countries, England the former, Russia the latter. State the powers of the two kinds of sovereigns.

The title is *hereditary:* explain and give examples of it from English history, and show how even that claim is sometimes passed by at the will of the people. Next take

Republics: Give its derivation, *res*, an affair, and *publicus*, belonging to the people, and from the derivation get the meaning; show how different from a monarchy, in its head, in the duration of office, in the power granted to the head; cite instances of modern Republics, United States and France; name some ancient Republics.

Advantages and *Disadvantages* of different kinds of government.

(Difficulty might arise from teacher's own opinions, and great care should be taken not to exaggerate one or the other.)

Of a Monarchy: its settled character, freedom from strife of parties, attempts at exceeding power of monarch, tendency to extravagance.

Of a Republic: The frequent expression of the will of the people, leading however sometimes to sudden changes; party strife.

Show that in England we have practically the advantages of a Republic without many of the disadvantages.

(4) In an infant school short pieces of poetry, little songs, and suitable hymns, should be committed to memory. The memory requires cultivating, words are needed, and suitable thoughts need to be put into children's minds.

In the fourth standard, children should commit to memory poetry, tables, facts of history, geography, and general knowledge. Some rules of grammar should also be learned and applied. Youth is the best time for strengthening the memory; in the fourth standard and other high standards, facts are needed to be known in order that inferences may be drawn from them. Those mentioned are likely to be of service in after life as well as serving to strengthen the memory.

(To be continued.)

Practical Needlework in Elementary Schools.

BY MISS J. W. WARREN,

Inspectress of Needlework to the Leicester School Board.

WE have in this paper to consider the Specimens and, later on, the work of the Third Standard. I feel sure all teachers will agree with me in saying that, of all years, the work prescribed for this is the most interesting and get-at-able. Turning to the Code, I find *Stitching, Tapeing, Herringbone, and Darning*, to be the four new elements, formidable enough in the hands of a muddler, but, reduced to method, becoming as interesting as the various occupations in a Kindergarten class. *Herringbone Stitch* should be first taught, on the principle of contrasts, these children having had to stick closely to the sew fell seam for some months past.

The stitch should be done on canvas of several makes. There are three I can, from experience, greatly recommend, and, indeed, I shall be happy to send a specimen to any of my readers who fail to find them by my description or diagram. I have found that different districts differ widely in naming the same material.

First the plain, stiff, single-thread ordinary canvas, white, known everywhere, used years ago, and now very largely. In remote country districts the Third Standard specimens sent in are usually done upon this canvas. It answers well where children and teachers are alike a little awkward; it yields reluctantly to rough handling, and for this reason is liked; but for practical purposes, surely something softer is better, something nearer the flannel upon which the herringbone is eventually done.

For this reason choose a fine Java canvas, or canvas cloth (see diagram).

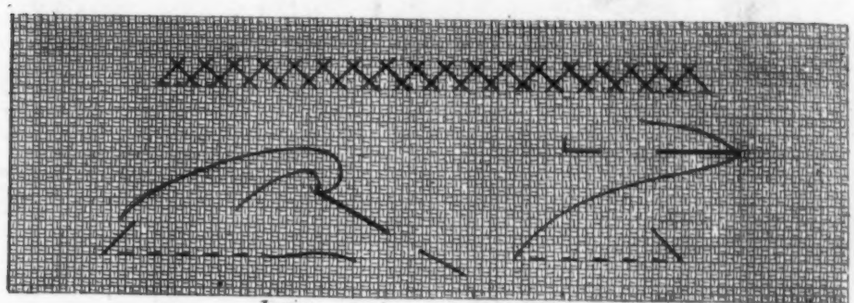
In the Java canvas we have a material upon which we can practise not only Herringbone, but Stitching and Darning: the canvas cloth will not do very well for the Stitching, though equally well for the other two. Each of these is expensive, being one shilling or more a yard, but if the plan of making a six months' sampler is followed, the average cost will be very little.

To teach the Stitch. Use, if you have it, a proper frame, upon which you can work the Stitch. In village schools a blackboard will serve the purpose, or any old frame can be converted into a needlework help by stitching tapes across both ways to illustrate the woof and warp of the canvas. Before showing the actual stitch, do a piece yourself upon canvas, *in front of your class.* They will learn, first, that you work from *left to right;* secondly, that you progress *downwards* or just in the opposite direction to the sew fell seam. Now proceed to show the work upon your frame; you will not have misled them in the handling; one of the great drawbacks to magnified work is this, in my opinion. Call special attention to the No. 4 in the threads, but show that only from left to right is this number left clear, that 4 are missed in the stitch, *but two taken up again in working it.* Work a piece upon your frame, do it over several times, test the knowledge by questioning, and make quite sure that the theory is mastered. Now prepare

No. 1 Fine Java Canvas.

(Not the stiff sold formerly for wool work.)

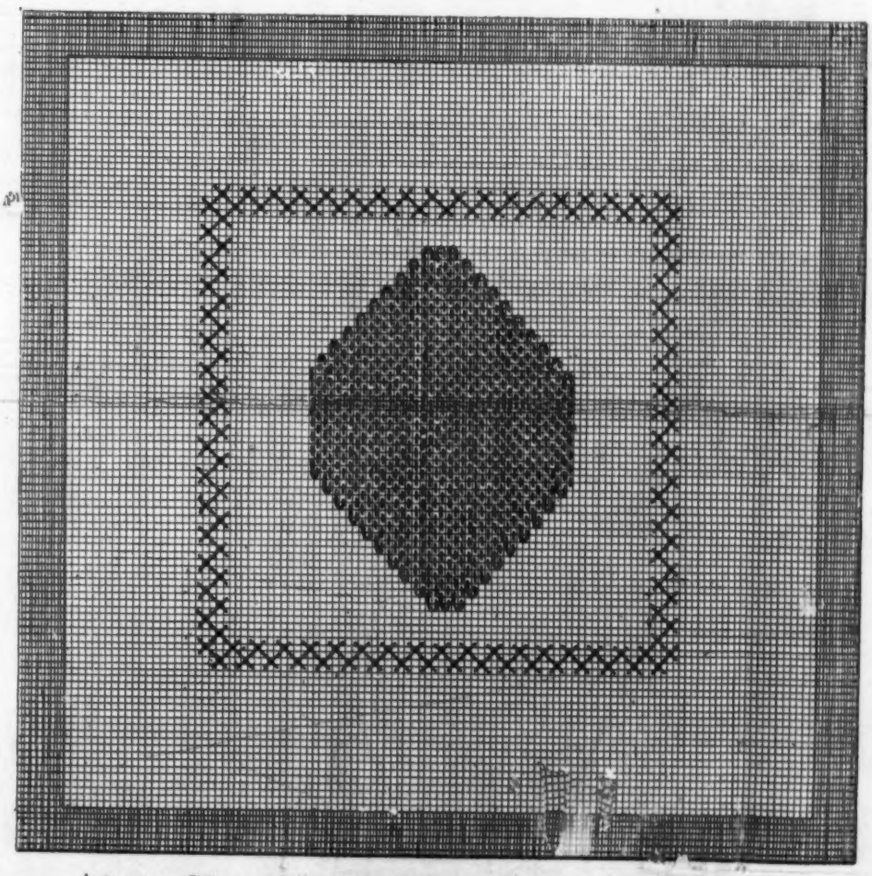
Showing the fasten on and end of herringbone stitch.



No. 2. Canvas Cloth.

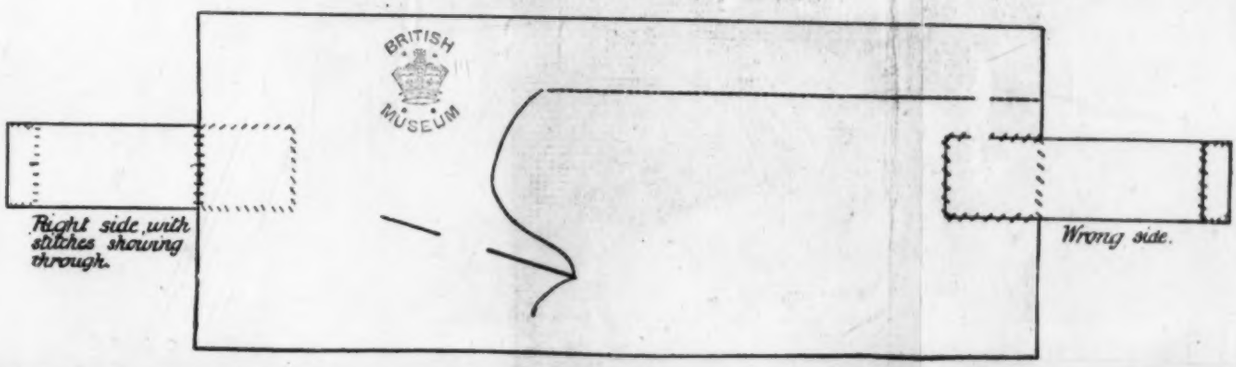
(Soft, not the old stiff fine Java, see notes.)

Showing darning and herringbone.



No. 3. Unprinted Shirting.

Material for stitching and tape specimens



and work *three stitches* as in diagram. Notice that the *third* is to the right. The fourth stitch will be done by the children at your dictation, and is more easily managed than if it were to the left. Do not teach fastening-on at this stage; it is quite enough to manipulate the stitch. Have a specimen begun for every girl. One of the upper standards can prepare these, which should be about 7 inches square when ready, and if regular hemming is taught, might be hemmed round and made to serve many turns; for it must be remembered that this stitch can be easily cut out, the canvas serving again. Do not be content to proceed another step until every child makes the regular stitch; rest assured that no failure can be allowed in so simple and interesting a specimen.

Fastening on and off.—How many allowed good ways are there? *Two*, if you consider strength as a necessary element. I have shown one in the diagram. The one runs at right angles to the work, the other parallel with the line of progress; the latter is the better. These, though shown on the right side of canvas, are, need I point out, on the wrong side of material, being upon the side the herringbone stitch is done. The plan adopted of putting the fastenings on the reverse side is, to say the least, misleading, directly the flannel patch is taught, both plans must be used; the inner square can have the fastening out of sight, but the outer needs to be begun on the same side as the actual stitch, and, when garments are made, this last plan is invariable. Put in detail, the plan on canvas is as follows:—

Along the right line of work count twelve threads from your intended first stitch, pick up twelfth thread, back-stitch it, darn back to your first intended stitch, and then proceed to herringbone.

To fasten off, back-stitch the last herringbone stitch, darn back twelve threads, back-stitch the last and cut off.

The second plan spoken of is exactly the same, only in a different direction.

A Third Plan is to conceal the start and finish between the *flannel fold*, and will be spoken of in its right place when the Fourth Standard Patch is described.

For teachers who prefer to hide it on canvas, the same details carried out on the other side will of course answer their purpose, and I am bound to confess that most teachers follow the plan, though they must know they are teaching the exception and not the rule.

When the fastening on and off have been taught it is an easy matter to teach the corner; and for the sake of those who will do so, I give an example of the bar, which, by the way, will only come right on material by a careful adjustment of stitches, at least three or four before the corner is reached, and the bar done before altering the position of the work in the hand. For practice, the best plan is to prepare a sampler of Java canvas, and upon it work either squares or lines of herring-bone, and in addition practise the darn and stitching. Much time is saved by not having to cut specimens; that wherever possible a larger one than code size should be adopted. No. 36 Coat's Coloured Cotton is the best for all Third Standard purposes; even the tape is better sewn with this number, and though not kept can be dyed to order. Another cotton much used, but expensive, is the D. M. C. No. 18 (Dollfus, Mieg & Cie., Mulhouse, Paris). This house, by the way, supplies the most beautiful cottons I have ever seen for all purposes, but for schools not under a Board it is impossible to use them owing to the expense.

The Plain Darn on Canvas.—This stitch can only be partly taught, owing to the different disposition of the threads in canvas and stocking web. When children are passed into the Fourth Standard, re-instructing is needed to teach the stitch. Provide every child with an ordinary 6 darning and 36 Coat's cotton, and a small piece of canvas, 4 by 3. Always begin to work upwards, and from right to left. All ordinary darning should be done on the wrong side, which can be indicated by a pencilled line on canvas. Let the first pick-up be without a cotton, giving the needle only. *Twelve threads* upon the needle can be easily managed, more will present an unnecessary difficulty. Have this darn continued until a square is formed; twelve up and twelve down rows will just form the square.

Be careful to explain the first thread to choose in each line, and also the size of loop to be left at the top and bottom (half an inch of cotton in all)— more is ragged looking and unnecessary. The plan of darning in a diamond shape is excellent, as it effectually prevents the error of taking up the same thread in the down line. No attempt to fancy darning should be made, but the instruction confined to the simple operation as in weaving, *one up, one down*.

When the square darn of 12 stitches and 24 rows has been practised, it will be well to to try the exact code darn. You will find that *sixteen threads on the needle* will give 1½ inch depth, and the ten rows when complete will cover a rectangular surface of 1½ *by* ½ *inch*, an ugly looking specimen, but a very practical depth, capable of covering any ordinary hole in a stocking when the ten rows are extended. I shall have more to say about this in the next Standard, so will only add that children need showing how to arrange both darn and herringbone upon the canvas. I have seen excellent work put upon the extreme edges of the canvas and so spoilt. Every piece shown should be as nearly like a picture as possible. No teacher in these days will deny the use of æsthetic teaching even in needlework.

Stitching.—Work this stitch first on canvas, but remember that to fix the work for stitching is almost as difficult as the stitch itself, therefore leave plenty of time for both teaching and practice.

As with the other new stitch, get specimens prepared, on which are worked three stitches at least. The start can be taught later. Show by *large specimen in front of class* that the cotton rises directly between eye and point of needle when a stitch is taken. Arrest the first stitch at this point; continue to do so until perfect uniformity is gained. You will have got over a little of the difficulty, but the next point, and one hardly ever attended to, is the *place of insertion for the needle*. This is often given as at the *end of last stitch*; it should be *just above the cotton of last stitch*, and can not only be taught, but the *reason* and *difference* excellently demonstrated on canvas. Again, the point

should *be brought through at the lower part* of the drawn thread, and *not exactly in the middle. The effect* can be easier seen than described. Do a few stitches both ways. You will never neglect this detail after, if you have done so hitherto. In examining for high state of efficiency this ought never to be overlooked, as the stitch in front can never be made regular by any other means, and the splitting of the cotton, consequent upon its neglect, often causes the stitching to wear rough, and sometimes to come out altogether. Apart from all this, one way is right, the other is really wrong, though very often done.

The band, together with the tapeing, will be fully explained next month.

(To be continued.)

—o—

How my School was Examined.

BY THE HEAD TEACHER OF A BOYS' SCHOOL.

STANDARD I.

Writing.—A line from a reading book was first copied, and then the following ten words were dictated:

Month, Branch, Swing, Soap, Salt, Clean, Talking, Cotton, Stable, Harvest.

Arithmetic.—Three sums were given, and some exercises in the multiplication table:—

1. 732 + 37 + 680 + 409 + 2.

2. From 929 take 190.

3. Take 123 from 700.

4 × 9. 6 × 3. 5 × 4. 6 × 7. 3 × 9. 4 × 8.

Answers: (1) 1,860. (2) 739. (3) 577.

Geography.—On production of a plan of the school, the Inspector drew attention to the difference in appearance of the school itself and the plan. Then he drew out the definition of a plan, and after placing the plan on the floor questioned the class on its details.

STANDARD II.

Arithmetic.—1. Multiply 58,937 by 56.

2. Divide 80,301 by 9.

3. Take 8,019 from 100,010.

4. If a ship sails four thousand and fifty miles in nine days, how many miles is that for each day?

N.B.—The first three sums were dictated, and the fourth written on the blackboard.

Answers: (1) 3,300,472. (2) 8,922 + 3 over. (3) 91,991. (4) 450 mls.

Dictation.—From 'The World at Home,' Standard II., page 74:

'When the storm had blown over they started again, thankful that none of them had been buried in the sand. With long strides the camels went on their journey, their large soft feet spreading out and keeping them from sinking. But the patient beasts got no water.'

English.—'The Village Blacksmith' was repeated collectively and individually, and such questions as the following were asked:—

What is meant by 'looks the whole world in the face'? Why is the blacksmith not afraid? When are people afraid to meet their neighbours? What is 'honest sweat'?

Nouns and verbs were taken orally from the reading books, and reasons were required for the words belonging to these classes.

Geography.—Questions were asked in connection with a test map of England. Stereotyped definitions found less favour than such as were given in the scholars' own words.

STANDARD III.

Arithmetic.—A specimen card.

1. Divide 245,637 by 358.

2. From £9,163 13s. 4½d. take £764 9s. 4¾d.

3. Add together £8,469 17s. 8d., £9 16s 11¾d., £87,056 7s. 10½d., £985 14s. 0¾d., and £68 0s. 7½d.

4. A horse-dealer sells a horse for £47 16s. 8½d.; what did he give for it if his gain is £8 19s. 7¾d.?

Answers: (1) 686 + 49 over. (2) £8,399 3s. 11½d. (3) £96,589 17s. 2¼d. (4) £38 17s. 0¾d.

Mental Arithmetic.—1. 6 times 1s. 2d.?

2. What is the half of 7s.?

3. How much more than 3s. 6d. is required to make half a-sovereign?

4. Divide 39 apples equally among 13 boys.

Dictation.—Passage from 'The World at Home,' Standard III., page 22. 'Yarmouth Roads lie between the coast and a dangerous sand-bank which does not rise to the level of the water. Its position is pointed out to sailors by floating lights. They are protected from the waves by the sand-bank, which forms a natural break-water, and affords a safe anchorage for ships.'

English.—The same piece was recited as in Standard II., with the addition of a shorter piece to make up the number of lines required by the Code.

The parts of speech were taken from the reading books. Reasons were asked for classing certain words as certain parts of speech.

Make a sentence containing a pronoun, a verb, and an adverb. What kind of word may be supplied in the sentence, 'He saw —— boys'? (*Adjective.*) Supply one. (*Ten.*) What sort of adjective is it? (*Of number.*)

Geography.—A test map of England was placed in front of the class and used very searchingly. Scholars were required to name and point out counties, manufacturing towns and physical features, particularly those of their own county.

STANDARD IV.

Arithmetic.—A specimen card.

1. Multiply £10,096 15s. 5¼d. by 381.

2. Reduce 10 chains 10 yds. 2 ft. to inches.

3. Divide £46 11s. 11¾d. equally among 23 persons.

4. If 25 cannon balls, each weighing 56 lbs., were shot off in a day, how many cwts. were shot off in 16 days?

Answers: (1) £3,846,870 1s. 8¼d. (2) 8,304 in. (3) £2 0s. 6¼d. (4) 200 cwts.

Dictation.—The following passage from Nelson's *Intermediate History of England*, page 84:—

'Many of the barons came that morning prepared to shed blood if necessary; but the King was as smooth and soft as the satin of his royal robe. Taking the pen with scarce a question he wrote the name which secured to Englishmen the full enjoyment of their freedom. And then, with smiles and gracious words, he galloped off to the castle. Scarcely able to believe that they had got the royal signature with so little trouble, they talked a while and separated.'

Grammar.—Parse 'Now blooms the sweet lily by the lake.'

STANDARD V.

Arithmetic.—A specimen card.

1. Find by practice the value of 11 tons 14 cwt. 3 qrs. at 10s. 9d. per cwt.

2. If 9 feet length of cast-iron pipe weigh 4 cwt. 3 qrs. 17 lbs., what will half-a-mile weigh?

3. Make a bill of the following:—

A leg of mutton, 9 lbs., at 10½d. per lb.;
A ham, 17 lbs., at 1s. 2½d. per lb.;
17 fowls, at 3s. 6d. per couple;
10 ducks, at 2s. 9d. each;
19 lbs. of butter at 1s. 3d. per lb.

4. If a gentleman left £2,500,—⅕ to a hospital, ⅔ of the remainder to a school, and the rest to be divided equally among 50 poor people, what did each receive?

Answers: (1) £126 3s. 6¾d. (2) 71 tons 18 cwt. 2 qrs. 8 lbs. (3) 7s. 10½d. + £1 0s. 6½d. + £1 9s. 9d. + £1 7s. 6d. + £1 3s. 9d. = £5 9s. 5d. (4) hospital, £500; school, £1,600; each poor person, £8.

Composition.—The following anecdote was required to be reproduced after it had been narrated by the Inspector:—

'A gentleman once owned a very intelligent dog. His master used to allow him a pennyworth of meat daily for his dinner, calling to pay the butcher at the end of every month. Regularly at one o'clock, the dog would proceed to the butcher's shop for his daily allowance. Every visit of the dog for his dinner was duly recorded by the butcher marking a cross on the back of his shop door. One morning the butcher placed two crosses on the door instead of the usual one, thinking no doubt his action would be unnoticed by the intelligent animal. The dog, however, was equal to the occasion; for he snatched another piece of meat in his mouth beside the usual pennyworth, and ran off with both. This made the butcher feel ashamed of his dishonesty, and he could not but admit that "Honesty is the best policy."'

Grammar.—Analyse and parse—'At length I to the boy cried out.'

Derivatives from the following words were asked, and the aid of Standard VI. boys was called in to explain the meaning of the Latin prefixes:—*reform, transport, export, wood, protect, observe*, and *wealth*.

Geography.—In this subject Standards IV., V. and VI. had been taught together, the part taken being the geography of Europe. Standards V. and VI. had learned to draw from memory the maps of France, Italy, and Spain. Questions of a searching kind were put, and frequent reference was made to the test map.

STANDARD VI.

Arithmetic.—A specimen card.

1. What will £750 produce at simple interest for three months at 4 per cent. per annum?

2. Of what sum of money is £56 11s. 9d. $\frac{11}{13}$?

3. If a boy put 38·5 of £108 instead of 38·5 of £118, what was the amount of his error?

4. If A does a piece of work in 6 days, and A and B working together do it in $2\frac{2}{3}$ days, in what time will B do it alone?

Answers: (1) £7 10s. (2) £61 14s. $7\frac{7}{11}$d. (3) £391 11s. 1⅓d. (4) 4 days.

Composition.—Write a letter to the Inspector, describing a visit to a menagerie.

Grammar.—Analyse and parse—'I know not what had made them so.'

Singing.—Standards I. and II. had been taught together according to the syllabus for Division III., and Standards III., IV., V., VI., had been taught as Division IV. The modulator was very freely used, and several Ear Tests were given, as well as the following Time Tests.

Division III.—

| 1 :— :1 | 1 : :1 | 1 :1.1:1 | 1 : : | 1 :— :— ‖

Division IV.—

| 1 :1 :1 | 1 :— :1 | 1 : : | 1 :—.1:1 |
| 1 :— :1 | 1 : : | 1 :— :— |— :— :— ‖

My Scholarship Answers.

BY GEORGE R. BARNARD,

DETMOLD ROAD BOARD SCHOOL, UPPER CLAPTON, LONDON.

(*First on the Scholarship List, 1889.*)

MALE CANDIDATES.

Geography and History.

(*Three hours allowed for this paper.*)

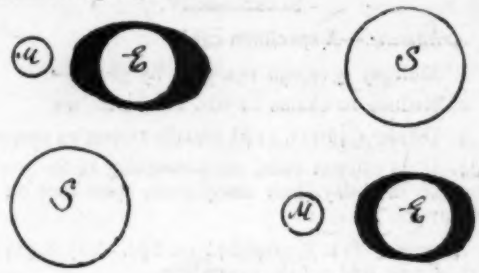
All candidates must draw a map. They may answer five questions in each of the 2 subjects, but not more.

GEOGRAPHY.

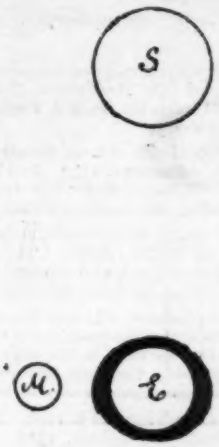
1. Draw an outline map, with lines of latitude and longitude, of—(*a*) North America, south of New Westminster and Labrador; *or* (*b*) India; *or* (*c*) England and Wales; marking the chief rivers, and indicating the chief watersheds.

3. State the causes of the difference between (1) Spring Tides and Neap Tides (2) and between the tides (*a*) in the Pacific Ocean (*b*) in the Atlantic Ocean (*c*) in the seas around the British Isles (*d*) and in the Baltic Sea.

When the sun and moon are in conjunction or opposition, *i.e.*, at new moon or full moon, Spring Tides are the result, because in these two cases the moon and the sun are both attracting in the same straight line.



When the moon is in quarters, the influence of the sun is exerted at right angles to that of the moon and hence Neap Tides take place.



Briefly the Spring Tides are caused by Moon + Sun, while Neap Tides are caused by Moon − Sun.

Pacific Ocean.—A real tide is here formed, because of the great expanse of water, but its rise and fall is very little (about 3 feet).

Atlantic Ocean.—The tide here is partly genuine and partly a derived tidal wave, being influenced by surrounding land. The tidal wave crosses the Atlantic in 4 hours.

Seas around Britain.—No real tide. It partakes more of the nature of a current. On account of shallow waters, tide travels slowly and therefore waters accumulate, higher tides being the result.

Baltic Sea.—Scarcely any tide felt at all (1) because of narrow opening (2) because of great efflux of water from Baltic caused by many rivers and small evaporation.

4. Describe the situation, and account for the rapid growth in modern times of seven of the following places:—Crewe, Swindon, Barrow-in-Furness, Middlesborough, Bournemouth, Blackpool, Brindisi, San Francisco, Winnipeg.

TOWN.	SITUATION.	REASON FOR RAPID GROWTH.
Crewe.	South of Cheshire.	Great centre for L. and N. W. railway.
Swindon.	North of Wiltshire.	Great centre for G.W. railway.
Barrow.	South corner of the Furness district of Lancashire.	Discovery of iron and coal in the district.
Middlesborough.	Centre of the Cleveland district in N.E. Yorkshire.	Discovery of iron and coal in the district.
Brindisi.	S.E. corner of Italy	Overland route.
Port Said.	North end of Suez Canal.	Canal traffic.
San Francisco	On Pacific coast in California.	Gold discovered.

5. Describe the situation and account for the name of Lombard Street, Regent Street, Chester, Cologne, St. Petersburg, Constantinople, Alexandria, Virginia, Pennsylvania, Adelaide. Refer to seven of these places only.

PLACE.	SITUATION.	REASON FOR ITS NAME.
Regent Street.	In West of London, leading from Pall Mall across Piccadilly Circus and Oxford Street in the direction of Regent's Park.	Named after the Regent George, afterwards George IV.
Chester.	Mouth of Dee in Cheshire.	Roman 'Castra' a camp.
St. Petersburg.	Mouth of River Neva in W. Russia.	Named after its founder, Peter the Great.
Constantinople	On W. of Bosphorous.	Named after Constantine.
Virginia.	Two of the Eastern United States.	Named in honour of Elizabeth.
Pennsylvania.	One of the Eastern United States.	Named after William Penn the Noncomformist.
Alexandria.	Near Western Mouth of Nile.	Named after Alexander the Great.

7. Give Notes on a Lesson in Physical Geography or in Historical and Commercial Geography on (1) The Mediterranean Sea, or (2) South America.

NOTES OF A LESSON ON THE MEDITERRANEAN SEA.

Physical Geography.

Time (30 minutes). Class (Standards V., VI. or VII.).
Apparatus necessary (Map, Blackboard, &c.).

HEAD.	MATTER.	METHOD.
Name	... Latin 'medius,' the middle, 'terræ,' land.	Explain how this was applied, and why.
Extent	... The largest inland sea. Length 2,400 miles. Area nearly 1,000,000 sq. miles.	Compare with other well known seas, or countries, as to size.
Islands	... Sicily, Sardinia, Corsica, Candia, Cyprus, Balearic Is., Lipari Is., Maltese and Ionian Is., and Greek Archipelago.	Show on map, mentioning any striking physical peculiarity about them.
Seas...	... Adriatic, Tyrrhenian, Ionian and Ægean Seas.	Refer to map, noting size, shape, &c.
Rivers	... Xucar, Ebro, Rhone, Arno, Tiber, Po, Adige, Vardar, Maritza, and Nile.	Refer to these, with especial attention to their size, and the quantity of water brought down.
Physical Peculiarities ...	(1) North coast very irregular. South coast regular. (2) Mediterranean is divided into two basins by a ridge running from Sicily across to Cape Bon. (3) Is very salt compared with surrounding ocean. Therefore, current runs in through Strait of Gibraltar.	(1) Refer to map. Why? (Because of position of mountain ranges). (2) Show on map, and trace mountains right through. (3) Explain very carefully how the saltness is caused (great evaporation and few large rivers), and show why a current should flow in.
Climate	... Warm and genial ...	Refer to Riviera, Naples, &c.

History.

8. State briefly the (*a*) extent of the dominions of, and (*b*) the kind of authority over their dominions possessed by three of the following:—Egbert, Alfred, Canute, William the Conqueror.

Egbert's dominions extended from the Forth to the English Channel, with the exception of the British portions of Cumbria, Wales, and Devon and Cornwall. His authority was merely that of an overlord; as his kingdom of Wessex had proved slightly superior to the others, so was his authority over the other kings. His time was well taken up in looking after the Danes and other pirates. Alfred's dominions were about the same as those of Egbert, with the exception of the Danelagh, a portion enclosed by the Thames, Lea, and Watling-street. His authority, after he had become firmly seated on the throne, was of a much superior character to that of Egbert. He really ruled the country, personally and thoroughly, and raised it from a warlike, unsettled place to a peaceable and prosperous nation. William the Conqueror's dominions included England and Normandy. He also subjugated Wales, and forced Malcoln, King of Scots, to do homage to him. His authority was a military authority. His system was the feudal system. The king divided the country between barons, the barons did the same on a smaller scale, and so on. The king thus had a certain kind of authority very firm, no doubt, but nevertheless very harsh.

9. Compare Henry II. and Edward I. with regard to—

(*a*) Extending dominions of the crown.
(*b*) Administration of justice.
(*c*) Relations with the clergy.

(*a*) Henry II. from his father inherited Anjou and Touraine, from his mother England, Normandy, and Maine. By his marriage he acquired Guienne, Poitou, and Gascony, and by affiancing his son Godfrey to Constance of Brittany, he thought to get possession of that province also. He was also nominally Lord of Ireland. Edward I. already possessed England and several French provinces, for which he did homage. He set to work to conquer Wales, which he did, and was engaged in subjugating Scotland when he died.

(*b*) Henry II. administered justice very well, considering the times he lived in. He dismissed all Stephen's mercenaries, destroyed castles built by Stephen's new barons, and granted a charter to the people similar to that granted by Henry I.

Edward I. took great personal interest in the administration of justice, and from his anxiety to preserve and improve English laws he is called 'The English Justinian.'

(*c*) Henry II. and his clergy, headed by Becket, were always hostile to each other. The points in dispute are easily shown by the Constitutions of Clarendon, among whose items the following is chief:—'Clergy for criminal offences to be tried by a civil court.'

Edward I. although he did not openly quarrel with his clergy, yet, he checked their growing power by the famous statute of Mortmain.

12. In what ways did James II. act unconstitutionally? What safeguards against like action on the part of the sovereign were provided on the accession of William and Mary? What further conditions were laid down before the accession of the House of Hanover?

James II. acted unconstitutionally:—

(*a*) By levying taxes without consent of Parliament.
(*b*) By violation of Test Act.
(*c*) By exercising dispensing power in behalf of catholics and nonconformists.
(*d*) By removing those judges who refused to be his abject instruments.
(*e*) By establishing High Commission Court.
(*f*) By prosecuting the 'seven bishops.'

Safeguards.—The Bill of Rights enacted:—

(1) Suspending and dispensing with laws is illegal.
(2) High Commission Court abolished.
(3) Subjects may petition King without being prosecuted for so doing.
(4) Parliaments should be held frequently.

Further conditions before accession of House of Hanover:—

(1) Sovereign must be protestant.
(2) England must not be called upon to defend foreign possessions of the sovereign.
(3) Judges not to be removed except for crime, or by Act of Parliament.

13. State briefly, with dates if you can, some facts of historical importance connected with Monasteries, Universities, the Poor Laws, the National Debt, the Bank of England, the East India Company, Negro Slavery.

Monasteries.—Suppression of lesser Monasteries, 1536. Suppression of greater Monasteries, 1539. As a result of the former of these a great rebellion called '*The Pilgrimage of Grace*,' broke out in Yorkshire, but dissolved without doing much good.

Universities.—Probably Oxford and Cambridge took the form of Universities in the twelfth century. The chief event in connection with the Universities was the spread of the Renaissance or New Learning during the sixteenth century.

The Poor Laws.—Edward VI. was the first reign in which laws were made concerning the provision of the poor. The Poor Law Act was passed in 1601, in the reign of Elizabeth, and continued till 1834 when the Poor Law Amendment Act was passed.

The National Debt was founded in 1692. In connection with it we have the South Sea Bubble, 1720. At the Treaty of Versailles the national debt was about £240,000,000.

The Bank of England was founded in 1694, and until 1834 was the only Joint Stock Bank in London.

East India Company.—Founded 1600. In connection with it we have the Indian wars, in the reign of George III. and in 1843, also the Indian Mutiny in 1857, and the abolition of the company in 1858.

Negro Slavery.—Abolition of slavery, 1833.

15. What events and persons are referred to in six of the following quotations? Give dates when you can.

(i.) 'Oh, father abbot,
An old man, broken with the storms of state,
Is come to lay his weary bones among ye.'
(ii.) 'From Richard's night to Bolingbroke's fair day.'
(iii.) 'Your Highness pleased to forget my place.'
. . . . . .
'The image of the king whom I presented,
And struck me in my very seat of judgment.'
(iv.) 'Vane, young in years, but in sage counsel old.'
(v.) 'Her crew had seen Castile's black fleet beyond
Aurigny's isle.'
(vi.) 'Rupert lost the day
By hanging on the flying crowd,'
(vii.) 'Then Denmark blest our chief
That he gave her wounds repose.'
(viii.) 'The sweetest of all music
The pipes at Lucknow played.'

(1) Refers to the end of Cardinal Wolsey at Leicester Abbey, 1530.

(2) Refers to the change of dynasty accomplished by the usurpation by Bolingbroke (Henry IV.) of Richard II's throne.

(5) Refers to the advent of a ship into Plymouth bearing news of the Spanish Armada, 1588.

(6) Refers to the Battle of Naseby, 1645, when Prince Rupert after chasing the Londoners, returned to find the day lost.

(7) Refers to the Battle of the Baltic, or as we generally call it, the Battle of Copenhagen, 1801.

(8) This refers to the relief of Lucknow in 1857 by Sir Colin Campbell and his Scotch regiments.

School Management.

(*Three hours allowed for this paper, with that on Music.*)

All candidates must answer Question 1, and may not answer more than seven other questions.

1. Write full notes of a lesson on *one* of these subjects:—
(*a*) Forests and forest trees.
(*b*) Prepositions and conjunctions.
(*c*) (*For Infants.*) The primary colours.

1. Notes of a lesson on prepositions and conjunctions. Class (Standard IV.). Time (30 minutes). Apparatus (Blackboard, &c.)

HEAD.	MATTER.	METHOD.
I.	Prepositions are those words which show the relation between two other words, *e.g.*,	Give numerous examples on the B.B. of a. b. and c., and then elicit examples from the class. Time would not be wasted if each child was required to give 2 or 3 examples, until the idea be fairly ground in and understood.
(*a*)	Relation between Noun (or pronoun) and Noun (or pronoun).	
(*b*)	Relation between Noun (or pronoun) and Adjective.	
(*c*)	Relation between Noun (or pronoun) and Verb.	
II.	Classification of preposition into simple and compound.	Give a few examples, but explain that this makes no difference in their functions.
III.	Conjunctions join :—	Point out carefully the distinction between Conjunctions and Prepositions. Conjunctions simply join. Prepositions join and also show relation as to place, time, manner, &c.
(*a*)	two sentences.	
(*b*)	two phrases.	
(*c*)	two words.	
IV.	Conjunctions are divided into Copulative and Adversative. Some Conjunctions which go in pairs are called Correlative.	If children were sufficiently advanced they might be taught the division into Co-ordinate and Subordinated. Give and take examples of all these.
V.	In order to further help children to distinguish. Each Preposition, with its following noun makes a phrase which is exactly equivalent to an adverb.	If they can once be made able to pick out 'prepositional phrases' on account of their adverbial function, the greatest difficulty will be overcome.

2. What are the requirements of the Code in the arithmetic of the Second and Third Standards, and what sort of oral or unwritten exercise ought to be given in those classes?

Standard II. Notation and Numeration up to 100,000. The four simple rules to short division. The multiplication table and the pence table up to 12s.

Standard III. In addition to the former, Long Division, Addition and Subtraction of Money.

The Mental or Oral Arithmetic should be short, should deal with concrete as well as abstract numbers and should be preparatory to the work of the next higher standard. For example, the Second Standard should have plenty of money-working sums, adding and subtracting, in order to make them familiar with Third Standard work. The Third Standard should be well drilled in weights and measures for a similar reason.

3. If you were at liberty to choose between 'English' and Geography as a class subject, which would you prefer, and why would you prefer it?

I should certainly choose Geography, because :—

(1). Although grammar is a splendid mental exercise, yet there are other mental exercises quite as beneficial and at the same time of practical use, *e.g.*, Scientific Subjects.

(2). Geography is of far more practical use to lads and men than a knowledge of English, especially the kind of lads which we have to deal with in our board schools. Their grammar will not help to fill their pockets, but their geography will guide them in search of employment, in matters of emigration, in travelling, &c., therefore will profit them.

(3). Geography is one of the most interesting lessons in the whole school work (if taught properly), while there is no subject that children abominate more than Grammar. There can evidently be no attraction in Grammar, except to the few gifted with high reasoning powers; to the remainder, it is dull and tedious, whereas every child can learn geography.

5. Take these lines, and show by what sort of questions and explanations you would try to make them intelligible and interesting to children :—

> The western waves of ebbing day
> Rolled o'er the glen their level way;
> Each purple peak, each flinty spire
> Was bathed in floods of living fire.
> But not a setting beam could glow
> Within the dark ravine below;
> Where twined the path in shadow hid
> Round many a rocky pyramid,
> Shooting abruptly from the dell
> Its thunder-splintered pinnacle.—SCOTT.

First of all, I should re-arrange the whole passage in prose order. Secondly, I should ask questions on the simpler parts and gradually reason out the more difficult.

'What is here described do you think?' 'Sunset.'
'What is this sight compared to?' 'The sea.'
'At sunset, what parts would be bright?' 'Mountain-top.'
'What parts would be dark?' 'Valleys.'
'Where did the path run?' 'Along the valley.'
'What kind of a path was it?' 'A crooked one.'
'Why so?' 'Because of the rocks that stood up sharply here and there.'

From this general kind of questioning go down to the meanings of individual words. Then go over the whole again, and let several of the lads try to put the passage in their own words. This will effectually show whether they thoroughly understand it or no.

6. Suppose you wished to explain to a higher class the difference between literal and figurative language, what illustrations would you give? How far might the passage quoted in Question 5 supply you with help?

A very good plan would be to take a piece which they all knew, say for example the poetry they were learning, and examine it, dividing it into literal and figurative sentences. Boys might be asked to put figurative lines into a plain literal sentence, thus:—

'The curfew tolls the knell of parting day'

The curfew bell rang to mark the end of the day.

Or taking the above piece we notice:—First four lines are figurative. The remainder is fairly literal with the exception of a word or so.

'The western waves of ebbing day' would mean The rays of the setting sun.

The second line would read 'Shone horizontally across the glen.' The third and fourth would read 'Each purple peak, each flinty spire was very brightly illuminated by the rays.'

8. Some school subjects are taught because they are useful as information, or in practical life, and others because they furnish good mental exercise. Name some departments of school work in each of these classes, and say which of them you think of most importance.

USEFUL IN PRACTICAL LIFE.	GOOD MENTAL EXERCISE.
Arithmetic.	Arithmetic.
Spelling.	Sciences.
Reading.	Languages.
Handwriting.	Grammar.
Geography.	Composition.
Sciences.	History.
Drawing.	
History.	
Languages.	
Composition.	

Naturally the most important are those which are useful in both cases, but apart from these, Reading, Spelling, and Handwriting are so essential that they rank as important as any. Finally, I think the most important are in order, Arithmetic, Reading, Writing, Spelling, Science, and Geography.

9. When and how is 'learning by heart' most useful in a school? Give reasons for and against committing to memory —(*a*) definitions of words, (*b*) rules of Grammar, (*c*) dates, (*d*) selections of poetry, and (*e*) arithmetical tables.

Learning by heart is useful :—

(1) At odd moments, before and between lessons.

(2) When the whole school is assembled, so that one class helps, and does not disturb another.

(3) In learning words of songs, and other necessary verses.

(4) In all things which are essentially dependent upon the memory.

(*a*) *Definitions of words* should not be committed to memory because the meaning of any one word depends largely upon the context, with the exception of technical and similar words.

(*b*) *Rules of Grammar* should not be learnt by heart, because Grammar, as a branch of Logic, should depend on the reasoning powers, and not on the memory.

(*c*) *Dates* must be learnt by heart as there is no other method under the sun.

(*d*) *Selections of poetry* should also be committed to memory as they are always extremely useful afterwards, and they give the memory excellent practice.

(*e*) *Arithmetical tables* are best learnt by heart, because, although they could be reasoned out, yet, they are so frequently wanted that a great deal of time is saved by having them at the finger ends.

11. What is meant by style and expression in reading, and how can they best be taught?

Style in reading means the general manner of the reader, which distinguishes him from another reader; thus some have a jerky style, some an easy, careless style, some a laborious style, and so on. The best way to procure a good style is to have a good model reader to copy, and plenty of practice at it. If a child reads with bad style, imitate him, exaggerate his fault, make him see his mistake, set him a good example once more, and then let him try again. This kind of thing will soon cure him.

Expression in reading is that utterance on the reader's part which shows that he thoroughly understands what he is reading about. Some lads don't understand, and, therefore, cannot show it, others understand, and yet do not show it. The latter require practice, but the only thing to cure the former is to give them reading books within their capacity.

Grammar and Composition.

*(*TWO *hours and a* HALF *allowed for this paper.)*

(No abbreviations of less than three letters is to be used in Parsing and Analysis.)

All Candidates must take the Composition, Parsing, and Analysis, and may answer three (only) of the other questions, viz., 1, 4, 5, 6, 7.

COMPOSITION.

Write a short essay on one of these subjects :—

(*a*) Any memorable place, city, castle, or battlefield which you have visited.

(*b*) The use of pictures in teaching.

(*c*) Colonisation.

THE USE OF PICTURES IN TEACHING.

Pictures should be made use of in teaching for two very important reasons. In the first place they are attractive and interesting, whilst secondly, they will express more with a little explanation than chapters of words. What child is there who will not strain eagerly to get a glimpse of the picture before him? Give a child a book, and will he not first of all turn over leaf after leaf in order to 'look at the pictures'? Not a child would fail to attend whilst his teacher was commenting upon some picture or view placed before the class. His eye, his ear, his mind, his whole senses would be concentrated on that picture and its explanation, and the lessons would then bear a charm that they had never possessed before. By all means let us use pictures in our schools, let our school walls be beautified with them, let the reading books abound with them, and let every teacher join in saying with regard to pictures in schools, 'the more the merrier.' Again, as we have said, one picture will give a better idea of the subject under consideration than a host of words. Geography lessons with good pictures and views to accompany them would be effective, easily remembered, and only to be excelled by a personal visit to the places mentioned. In this lesson especially pictures are instructive providing always that they are truthful. In reading lessons too, how useful pictures are in rendering the matter perfectly clear, and impressing it on the mind. A great deal more might be said in favour of pictures, but enough has already been said to prove beyond a doubt that they are extremely useful, aye, and even essential to the teacher.

GRAMMAR.

1. Paraphrase this passage :—

> Earth has not anything to show more fair.
> Dull would he be of soul who could pass by
> A sight so touching in its majesty:
> This city now doth like a garment wear
> The beauty of the morning; silent, bare,
> Ships, towers, domes, theatres, and temples lie
> Open unto the fields, and to the sky;
> All bright and glittering in the smokeless air;
> Never did sun more beautifully steep
> In his first splendour, valley, rock, or hill;
> Ne'er saw I, never felt, a calm so deep;
> The river glideth at his own sweet will;
> Dear God! the very houses seem asleep;
> And all that mighty heart is sleeping still!
>
> *Sonnet composed on Westminster Bridge. Wordsworth.*

This sight is one of the most beautiful in the world. No one with any sense of beauty could pass by this majestic scene untouched. The city in this morning air is beautiful to behold. Every prominent point, be it mast, tower, or spire, stands open to the sky unclouded by smoke. Everything is bright. The sunrise on the city is quite as beautiful as any sunrise o'er valley, hill, or rock; besides this, all is calm and still as could be, the river is the only thing moving, and that moves on so softly that none can hear, even the houses appear to be sleeping, in fact the great city, the heart of the whole country gives no audible throb.

Parsing.

2. Parse this sentence :—

When beggars die there are no comets seen.
The heavens themselves blaze forth the death of princes.

When—Adverbial conjunction, subord., joining 'beggars die' to 'there are no comets seen.'

beggars—Noun, com., plur. num., com. gen, nom. case to the verb 'die.'

die—Verb, weak, intrans., active voice, indic. mood, pres. indef. tense, 3rd per., plur. num., agreeing with its nominative 'beggars.'

there—Conjunction used idiomatically, solely for the purpose of placing the verb before its nominative.

are—Verb, strong, intrans., used here as auxil. of voice with 'seen.'

seen—Past participle of the verb 'see,' here used with verb 'to be' to form compound verb.

are seen—Verb, strong, trans., passive voice, indic. mood, pres. indef. tense, 3rd pers., plur. num., agreeing with its nom. 'comets.'

no—Adjective, negative, qualifying 'comets.'

comets—Noun, com., plur. num, neut. gen., nom. case to the verb 'are seen.'

The—Adjective, distinguishing, pointing out 'heavens.'

heavens—Noun, com., plur. num., neuter gen. (here used as common gender), nom. case to the verb 'blaze.'

themselves—Pronoun, reflexive, 3rd pers., plur. num., com. gen., nom. in apposition with 'heavens.'

blaze—Verb, weak, trans., act. voice, indic. mood, pres. indef. tense, 3rd per., plur. num., agreeing with its nom. 'heavens.'

forth—Adverb of manner, mod. 'blaze.'

the—Adjective, disting., pointing out 'death.'

death—Noun, abstract, sing. num., neut. gen., objec. case, gov. by verb 'blaze.'

of—Preposition, gov. 'princes,' in the obj. case.

princes—Noun, com., plur. num., masc. gen., obj. case, gov. by 'of.'

3. Analyse the following passage, so as to show (1) how many separate sentences there are in it; (2) how they are related to one another; and (3) what are the parts or separate elements of any *two* of them:—

They parted, ne'er to meet again.
But never either found another
To free the hollow heart from paining;
They stood aloof, the scars remaining
Like cliffs which had been rent asunder;
A dreary sea now flows between:
But neither heat, nor frost, nor thunder,
Shall wholly do away, I ween,
The marks of that which once hath been.

Coleridge.

No.	Sentences.	Kind & Relation.
1.	They parted, ne'er to meet again.	Principal, copulative, co-ordinate with 3 and 5, adversative co-ordinate with 2 and 7.
2.	But never either found another to free the hollow heart from paining.	Principal, co-ordinate with 1, 5, 3, and 7.
3.	They stood aloof, the scars remaining like cliffs.	Principal, co-ordinate with 1, 2, 5, and 7.
4.	Which have been rent asunder.	Adjectival, qualifying the noun cliffs, 3.
5.	A dreary sea now flows between.	Principal, co-ordinate with 1, 2, 3, and 7.
6.	Neither heat, nor frost, nor thunder shall wholly do away the marks of that.	Noun, objective case, gov. by the trans. verb, 'ween,' 7.
7.	But I ween.	Principal, co-ordinate, 1, 2, 3, and 5.
8.	Which once hath been.	Adjective, qualifying the pronoun 'that,' 6.

Sentence 2.

But	Copula.
either	Subject.
found	Predicate.
another	Object.
to free the hollow heart from paining	Enlargement of the object.
never.	Extension of time.

Sentence 3.

They	Subject.
stood	Predicate.
aloof	Extension of manner.
the scars remaining like cliffs.	Absolute phrase used as extension of manner.

4. If you see anything wrong in the following sentences, correct them and give your reasons:—

(*a*) I never remember to have seen him before.
(*b*) The deserve to receive condign punishment.
(*c*) Please to send either a written or a verbal reply.
(*d*) I intended to have pointed this out yesterday.
(*e*) He hoped everyone had enjoyed themselves.
(*f*) The climate is as good, or even better than that of Madeira.

(*a*) Should be 'I never remember having seen him before,' because participle should be used instead of gerund.
(*b*) Leave out 'to receive' because it is redundant.
(*c*) Omit 'to,' as it should be imperative mood, not infinitive.
(*d*) Is not wrong at all—might be equally well rendered 'I intended to point this out yesterday.' It is not necessary in this case to use the perfect, but it is not wrong.
(*e*) 'He hoped everyone had enjoyed himself' (or herself). Reflexive pronouns must agree in number with their original.
(*f*) 'The climate is as good *as*, or even better than that of Madeira.'

The phrase 'as good' requires conjunction 'as' to complete comparison of equality.

6. Point out the difference in meaning between the words in each of the following pairs; and put each word into a sentence of your own construction:—

Reverend and reverent. Permissive and permissible.
False and fallacious. Benevolent and beneficent.
Apathy and antipathy. Distinct and dissimilar.

Reverend applies to persons.
Reverent applies to states or actions, *e.g.*,
'The reverend gentleman made a few appropriate remarks.'
'The students sat in reverent attitude round their master's chair.'
False applies usually to persons.
Fallacious applies to statements, *e.g.*,
'Alas! She was false to me.'
'Your statement, Sir, is, to say the least of it, fallacious.'
Apathy means *without* feeling.
Antipathy means a feeling *against*, *e.g.*,
'The whole proceeding was carried on with careless apathy.'
'He was regarded with great antipathy by his tenants.'
Permissive, able to permit (active).
Permissible, able to be permitted (passive).
'We tried in vain to make him more permissive.'
'He declared the thing was not permissible.'
Benevolent means 'well-wishing.'
Beneficent means 'well-doing.'
'His countenance beamed with benevolent smiles.'
'His costly gift denoted his beneficent conduct.'
Distinct, having little or no connection.
Dissimilar, actually unlike.
'There are two distinct parts to the poem.'
'One character is *entirely* dissimilar to the other.'

French.

(*Two hours allowed for this Paper.*)

1. Translate into English—

La tempête dura toute la nuit; la jeune fille la passa sans abri dans ce lieu désert, exposée aux torrents de la pluie. qui ne cessa que vers le matin. Lorsque l'aube parut, elle se traîna jusqu'au chemin, extenuée de froid et de faim, pour continuer sa route. Heureusement un paysan qui passait eut pitié d'elle et lui offrit une place sur son chariot. Vers les huit heures du matin, elle arriva dans un grand village. Le paysan, qui ne devait pas s'y arrêter, la déposa au milieu de la rue et continua sa route.

Parse in the above: *exposée*, *offrit*, *devait*.

The storm lasted all night. The young girl passed it, without shelter in this desert place, exposed to the torrents of rain, which only abated towards the morning. When the dawn appeared she dragged herself as far as the road, exhausted with cold and hunger, in order to go on her way. Happily, a countryman, who was passing by, took pity on her, and offered her a seat on his cart. About eight o'clock in the morning she arrived at a good-sized village. The peasant, who did not intend to stop here, placed her down in the middle of the road, and continued his journey.

exposée. Past participle of exposer (va. 1, r.), sing. feminine, qualifying and agreeing with the noun 'fille.'
offrit. (offrir, offrant, offert, j'offre, j'offris). Verb (va. 2 irr.), trans. past def., 3rd pers., sing. num.
devait. (devoir, devant, dû; je dois, je dus), v., an. 3 r.), Imperfect tense., 3rd per., sing.

2. Translate into English—

En entrant dans le salon, elle fut intimidée par l'air de cérémonie et par le silence qui y régnaient: jamais elle n'avait vu d'appartement si orné, et sourtout si bien éclairé. La société était nombreuse et disposée en groupes: les jeunes gens jouaient autour d'une table dans un coin de la chambre, et tous les regards étaient fixés sur elle.

Parse *entrant*, *vu*, *nombreuse*, *autour*. In parsing verbs give the particles.

(2) On entering the drawing-room, she was frightened by the formal manner and by the silence which reigned there. Never had she seen any apartment so adorned, and, above all, so well illuminated. The guests were numerous, and were dispersed in groups, the young people were playing around a table in one corner of the room, and all eyes were fixed upon her.

entrant (entrer, entrant, entré, j'entre, j'entrai). Present participle, gov. by preposition 'en.'

vu (voir, voyant, vu, je vois, je vis). Verb 3rd con., irreg. Past participle used with 'avoir' to form perfect tense .

nombreuse. Adjective, singular, feminine, agreeing with and qualifying 'societé.'

autour. Adverb of place mod. 'jouaient.'

3. Give the personal pronoun of the first person in all its forms, and explain when they are used. Write out the imperfect subjunctive of *avoir*; also interrogatively the present indicative of *parler*.

Personal Pronouns of the 1st Person.

Je (j' before vowel or h mute) is the nom. sing. conjunctive, and is used in connection with the verb.

Moi is the nom. sing. disjunctive, and is used apart from the verb, as in answering questions, &c.

Me answers for both 'me' (accus.) and 'to me' (dat.).

The disjunctive forms of this are:—

de moi (of me); *à moi* (to me); *moi* (me), accus.

Plural forms.

Conjunctive:

nous, this is both nom., dative, and accusative.

Disjunctive:

nous (we); de nous (of us); à nous (to us); nous (us).

In addition to these we have the reflexive forms:

me, myself.
nous, ourselves.

Imperfect subjunctive of avoir:

Que j'eusse	Que nous eussions.
Que tu eusses	Que vous eussiez.
Qu'il eût	Qu'ils eussent.

Pres. ind. of parler (interrogatively):

Parlé-je?	parlons-nous?
Parles-tu?	parlez-vous?
Parle-t-il?	parlent-ils?

4. Write in French:—Tell me what you know—Who was the best of all the Romans?—This tea costs three francs a pound—Allow me to be your friend.

1. Dites-moi ce que vous savez.
2. Qui était le meilleur de tous les Romans.
3. Ce thé-ci coûte trois francs pour le livre.
4. Permettez-moi, sil vous plait être votre ami.

Music.

(*Three hours for this and School Management.*)

The Tonic Sol-fa questions are on the other side. Candidates must keep *entirely* to one set of questions or the other. *You are not permitted to answer more than* FOUR *questions.*

2. Describe the intervals (major third, &c.) formed by the following pairs of notes:—

(1)	(2)	(3)	(4)
se	f	se	f
m	l_1	r	s_1

(1) Major third.
(2) Minor sixth.
(3) Pluperfect fourth.
(4) Minor seventh.

3. Rearrange the following notes in order of pitch, placing the lowest notes first:—

s_1 t fe r^1 ma se d ta l_1 d^1
s_1 l_1 d ma fe se ta t d^1 r^1

4. Write the pulse signs—

(1) For six-pulse measure.
(2) For four-pulse measure.
(3) For three-pulse measure.

(1) | : : | : : ‖
(2) | : | : ‖
(3) | : : ‖

5. Write an ascending minor scale (*lah* mode) using the minor or essential sixth and the major or essential seventh.

l_1 t_1 d r m f se l

The following letters will be of great interest to our readers:—

Jan. 11th, 1890.

DEAR SIR,—I notice that Mr. Barnard in his Euclid Paper, 'Scholarship Answers,' in your issue of January, does not give words such as you find in any of the common editions of Euclid's elements. I should like to know whether the book-work was done precisely as per answers in your issue. If such was the case, it is not generally known among teachers that such abbreviated method was allowable, and in the future much time will be saved by using Mr. Barnard's method than by writing, for instance, the 13th Prop., Bk. II., as per Pott's edition. The former method would hardly take a quarter of an hour, while the latter could not be written in less than half an hour.

Yours,
W. D.

Training College, Borough Road, S.E.,
Jan. 14th, 1890.

DEAR SIR,—With reference to the Euclid Paper in 'My Scholarship Answers,' I should like to say that the style which I used at the Scholarship Examination was the same as that published in the columns of the PRACTICAL TEACHER.

At the time of the Exam I thought it was quite sufficient to give a short, though logical, proof, and I adopted that course, at the same time bearing in mind the caution, at the top of the paper, against using symbols of operation, *e.g.*, +, —, &c.

I did not at all learn the Propositions in Euclid, word for word, so that had I wished to write them verbatim I could not have done so.

I simply proved the given example in as brief a manner as possible, compatible with clearness; and I take it, from the result, that my idea was correct.—I remain, yours truly,

GEO. R. BARNARD.

—— o ——

Our Certificate Class.

BY DR. GEORGE BEACH, M.A.

Head Master of Christ Church Schools, Macclesfield, Co-author of 'Our Mother Tongue, &c.'

WE have received a number of communications with respect to our assessment of the Certificate Questions in last month's article, which state more or less vigorously that the difficulty of the tests was under-rated, and adducing, as corroboration, various by-no-means-easy queries culled from the Examination Papers.

It only needs to be said that—

(1) the examination ought to be difficult;
(2) we still do not consider it much more difficult than usual, and that
(3) we have no bias in favour of a despotic Department. (See p. 507, top of first column.)

REVIEW OF QUESTIONS SET TO FEMALES.

Two subjects whereon identical questions were set, viz., School Management and Music, have been treated of in the January issue.

The other common subject—Dictation, may be shortly dismissed as being slightly more difficult than ordinarily; but greater explicitness and care were manifested by the Department in the direction of careful giving-out and audibility.

HISTORY.

Fifteen questions were set, one of which—the last—may fairly be considered beyond the proper range, otherwise they were very just.

This paper will have been splendidly answered by those pupils who have conscientiously worked according to our Routines, and who mastered our Test Paper of November.

Question I. was partly set in Question I. of November, and was fully detailed in the Routines for Tuesdays of third week in April, May, June, July and August.
" II. was not specially denoted in our pages.
" III. was partly set in Question VI. of November, and was directly pointed out in the Routines for Fridays of third week of April, May, June, July.
" IV. Three of the dates required were asked for in our Question VIII. of November Test Paper.
" V. was half set in Question XII. of November, and in Thursday, second week of July.
" VI. Actually set in Question II. of November. (See also Routine for second Tuesday in May.)
" VII. Not specially attended to in this magazine.
" VIII. could be answered by any intelligently educated person, and required no special preparation.
" IX. Actually set in Question IV. of November Test Paper. See also Routine for second Tuesday in September.
" X. See remarks on Question VIII., and Routine for Wednesday, third week in June.
" XI. Partially set for third Fridays of April, May, and July.
" XII. Half answered on p. 412 (November).
" XIII. Denoted for third Wednesday of July and third Friday of May.
" XIV. Set for second Thursday of April.
" XV. Beyond Syllabus.

Summing-up.—Out of the eight questions required, two were 'common-sense,' and five were wholly or partially set in one Test Paper (November), and nine were explicitly pointed out in the Routines.

GEOGRAPHY.

Twelve questions were propounded, of, with exception of Question 12, a very fair character, and as only *seven* were allowed to be answered, the Paper was of average ease.

Question I. Nearly like Question I. of our November test. It was set in Routines for first Friday in October, and third Mondays in June and October.
" II. Nearly like Question XI. in November issue.
" III. and IX. not specially spotted.
" IV. See half of Question IV. in November Test Paper.
Question V. is an ordinary one, and was attended to in Routines for the fourth Monday of April, and the second Mondays of May and October.
" VI. is also an ordinary one, but was partly set in Question XI. of November.
" VII. and VIII. general ones, fully set in Routine.
" X. partly set in *November's* Question 12, actually given for fourth Wednesday of July, and touched upon for fourth Wednesday in August, and third Wednesday in September.
" XI. was specially set in second Thursday of September.
" XII. is of a doubtful character, and depends upon very recent occurrences.

Summing-up.—Out of the seven questions required, two were 'common-sense,' requiring very little special knowlege, five were more or less anticipated in our November Test Paper, and six were also particularly pointed out in the Routines.

ARITHMETIC.

This paper was of much more than average difficulty, there being three questions (1, 8, 15) purely theoretical, and three others (9, 12, 14) considerably involved. Question XV. is grossly unfair, beyond, altogether outside the requirements, and Question I. is open to the same objection.

Question I. was not touched upon in our Routines; nor did we dream of treating thereof. A similar criticism applies to Question XV., although the ordinary *arithmetical* theory of Proportion was set by us for the second Thursday in July.
" II. See third Tuesday in June. An easy question.
" III. A fair one—see Question X. in August issue, and lesson for second Saturday in July. For fourth Tuesday in May, an almost identical example was set.
" IV. A very easy question; suitable for Standard VI.
" V. A Standard VII. sum.
" VI. Actually given in our August Test (Q. 14). See also third Wednesday in May.
" VII. Similar to Questions II., III., XI., in our August Test. See also lesson for fourth Thursday in May.
" VIII. See second Saturday in June.
" IX. An ordinary one, dealt with repeatedly in the Routines.
" X. See second Saturday in June.
" XI. Partly in accord with August Test Question VIII. Fully treated of on p. 207, July.
" XII. See Question VI. of August Test, and Routine for first Friday in June.
" XIII. Specially given for first Friday in August. See also lessons for second Saturdays in April and May and fourth Friday in August.
" XIV. Similar example given for first Friday in August.
" XV. See general remarks at head, and on Question I.

Summing-up.—Ten questions were to be answered out of (practically) thirteen, five of which were of not above average difficulty. Every question within the proper limits had received our attention, and TWELVE had either been specially discussed, actually given, or were easy ones, to treat of which would have wasted space or time.

Nevertheless, for the two reasons given above, we do not consider the paper a reasonable one.

ENGLISH.

This portion of the examination was more severe than usual. Not only was very little latitude of choice allowed (eight questions having to be answered out of ten), but several questions, such as IV. and V., were of a high order, and half of the latter is, strictly speaking, beyond the Syllabus.

We have not therefore been quite so successful in our forecasts with regard to this subject, as in every other instance; nevertheless, those who have honestly worked according to our methods would work a very respectable paper indeed.

Questions III., VI., VIII. and X. are of the usual kind, and could be answered from ordinary text-books.

" IV. is exceedingly difficult, speaking in a relative sense, the parsing of the words '*have been*,' '*that*,' '*were out*,' and '*would*' being very catchy and requiring a critical knowledge of English.

" V. has been commented on above.

" I. is very similar to Question I. of our December Test Paper, the essays in each being upon — (a) A material object; (b) A more abstract subject; and (c) An extract from the play.

" II. was actually paraphrased by us: (a) in June; (b) in September.

" VI. was partly set for paraphrasing in Question II. of our December Test Paper. See also p. 347.

" VII. was two-thirds given in the September article. See also the August article, and the Routine for third Friday in June.

" IX. See Routines for first Friday in April and July.

Summing-up.— Besides the common-place questions four have been specially selected by us. The English test was decidedly hard.

DOMESTIC ECONOMY.

This subject illustrates and justifies our marvel at the method (?) of examination adopted by the Department. Why, for instance, in such a comparatively easy and interesting subject as Domestic Economy, should a choice of eight out of twelve questions be given, and in the much less familiar and abstract subject—English, should eight out of ten be required? We give it up.

Questions I., VI., X. are of the usual stamp, and simply required honest work.

" II. was similar to Question X. in September Test Paper.

" III. was set for second Wednesday in May, second Wednesday and third Thursday in August.

" IV. See second Wednesday in June.

" V. See fourth Monday in April, fourth Friday in May, and second Friday in June.

" VII. was mapped out in Routine for second Friday in April, and first Monday in July.

" VIII. was forecast in Question XII. of September Test Paper.

" IX. was also actually set for fourth Friday in July. See also fourth Tuesday and fourth Friday in April.

" XI. was very fully and closely explained on pages 267 and 316 of our articles. See also fourth Saturdays in April and July.

" XII. The first half was set for second Monday in August, and the second half explained in our August article.

Summing-up.—A very easy paper, not a single question approaching the verge of the Syllabus, and a considerable latitude of choice being allowed. Six of the questions have actually been given in our pages, and three others specially spoken of.

GRAND SUMMARY.

The examination, as a whole, was of increased severity, although there were several decidedly easy papers. FORTY *questions were in great measure positively foretold and many others indicated. We would specially call attention to this assertion, for we have fully given above the means of verifying it.* It is therefore no wildly inaccurate statement put forth for advertising purposes, but in justification of our preliminary assertion that 'To all students of average ability, industry and ordinary attainments who should follow our Routines and Articles we could promise a PASS.'

CORRESPONDENCE.

Any letters may be addressed either to 'THE CERTIFICATE EDITOR,' *at Pilgrim Street, Ludgate Hill, or to Christ Church Schools, Macclesfield.*

Communications requiring epistolary replies will, if containing stamped and addressed envelope, receive prompt attention.

ANSWERS TO CORRESPONDENTS.

UPPER BANGOR.—Yes. See notice below. Your letter forwarded to GENERAL EDITOR.

CRUSADER (Neath).—You have hit the 'crux' of the whole affair.

EX-P. T. (Rochdale). — There cannot be absolute uniformity.

FIRST YEAR (Bexhill).—(*a*) We do not specially write for the First Year Certificate, but to many points our remarks will apply. (*b*) (1) Freehand Drawing; (2) Geometrical Drawing for Science Subject I.; (3) Perspective; (4) Model Drawing on Blackboard; (5) Drawing in light and shade from common casts or ornaments. (*c*) There is no really good one at present in existence, but a handbook on the subject will be shortly issued by Mr. Hughes.

F. G. G. (Croydon).—Second Letter. We are much obliged for your courtesy.

H. E. R. (Mendlesham), H. R. (Longton), R. B. S. (Catterick), and F. G. G. (Croydon), answered per ordinary letter.

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1. WE SHALL BE VERY GLAD TO HEAR FROM OUR READERS THE RESULTS OF THEIR CERTIFICATE EXAMINATION.

2. THE THIRD ANNUAL SERIES OF OUR ARTICLES, 'OUR CERTIFICATE CLASS,' WILL COMMENCE NEXT MONTH (MARCH).

3. All intending candidates should AT ONCE proceed to obtain the requisite foundational and general knowledge upon which the special acquirements are to be based.

Query Column.

RULES.

1. **Each correspondent is restricted to *one question*.** We should be much obliged if correspondents, who send questions for solution, would give (if possible) the required answer, and the source from which the question is obtained.

2. No query can be answered unless accompanied by the real name and address of the sender, not necessarily for publication, but as a guarantee of good faith and for facility of reference.

3. ☞ **When a pseudonym is adopted it should be written at the end of the query, and the real name and address on a separate piece of paper.**

4. Correspondents are requested to write their queries *legibly*, and on one side of the paper only.

5. Replies will not be sent through the post.

6. Queries must reach the office *not later than the 12th of the month*, or they cannot be attended to in the following issue.

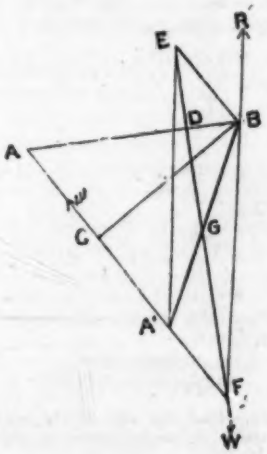
*** All communications for this column should be addressed—'*The Query Editor*,' *The Practical Teacher, Pilgrim Street, Ludgate Hill, London, E.C.*

General.

1. W. T.—A and B are two points in a horizontal line; a uniform rod whose length is AB and weight W turns freely round a hinge at one end at B; the other end is fastened to a thread which passes over A and carries a weight w; find the inclination of the rod to the horizon when at rest, and the pressure on the hinge in terms of W and w.

If a rod AB turning freely round a hinge at A rests, at an inclination of 30° to the horizon with its end B against a smooth plane inclined at an angle of 60° to the horizon, and to the end B a thread is fastened, which passing over a small pulley at the top of the plane hangs freely, and has attached to it a weight equal to half that of the rod, find the pressure on the inclined plane. (*Science Papers.*)

(*a*)



Since W, w, and R are in equilibrium, their directions pass through a point.

Let BA^1 be the position of the rod when the forces are in equilibrium, and let the angle ABA^1 be θ, which we have to find.

Bisect A^1B in G. Then the weight W acts vertically through G.

Since the force w acts along A^1A, if we let AA^1 and the vertical through G meet in F, the pressure on the hinge must act along FB, the three forces R, W, and w being in equilibrium.

Through A^1 draw A^1E parallel to FB, and through B draw BE parallel to FA.

Since G is the middle point of A^1B, the figure A^1FBE is a parallelogram.

Since $BA = BA^1$,

$$\therefore \text{Angle } BAA^1 = \text{angle } BA^1A = \tfrac{1}{2}(180^\circ - \theta) = 90^\circ - \frac{\theta}{2}.$$

If D be the point where EF cuts AB, since ADF is a right angle, the angle $AFD = 90^\circ - \text{angle } BAA^1 = \frac{\theta}{2}$.

Taking moments round B (putting $AB = 2a$),

$$a \cos\theta \, W = 2a \cos\frac{\theta}{2} w$$

$$2\cos^2\frac{\theta}{2} W - W = 2\cos\frac{\theta}{2} w$$

$$\cos^2\frac{\theta}{2} - \cos\frac{\theta}{2} \cdot \frac{w}{W} = \tfrac{1}{2}$$

$$\cos^2\frac{\theta}{2} - \cos\frac{\theta}{2} \cdot \frac{w}{W} + \left(\frac{w}{2W}\right)^2 = \tfrac{1}{2} + \frac{w^2}{4W^2} = \frac{2W^2 + w^2}{4W^2}$$

$$\therefore \cos\frac{\theta}{2} = \frac{w}{2W} \pm \frac{\sqrt{2W^2 + w^2}}{2W} = \frac{w \pm \sqrt{2W^2 + w^2}}{2W}.$$

From the triangle BEF which is parallel to the directions of the forces

$$BF : BE : EF = R : w : W;$$

$$BF^2 = EF^2 + BE^2 - 2\,EF.BE\cos EBF$$

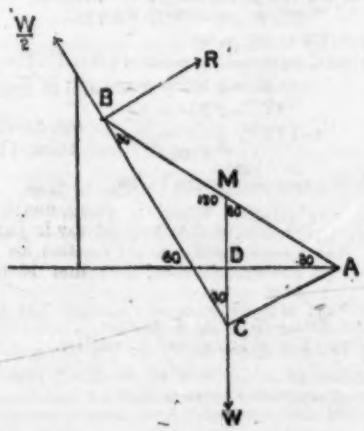
$$\therefore R^2 = W^2 + w^2 - 2W \cdot w\cos\frac{\theta}{2}$$

$$= W^2 + w^2 - \frac{2W \cdot w}{2W}\left(w - \sqrt{2W^2 + w^2}\right)$$

$$= W^2 + w^2 - w^2 + w\sqrt{2W^2 + w^2}$$

$$= W^2 + w\sqrt{2W^2 + w^2}.$$

(*b*)



Let the figure be drawn, and angles marked.

M is the middle point of AB.

Since $MB = MC = MA$, a semi-circle can be described about BCA.

$\therefore$ Angle BCA is a right angle, and angle MCA = 60°.
$\therefore$ MCA is an equilateral triangle.
Let AB = $2a$, then AC = a.

$AD = \frac{a\sqrt{3}}{2}$, and EC = $a\sqrt{3}$.

Taking moments round A,

$$R a\sqrt{3} + \frac{W}{2} \cdot a = W \cdot \frac{a\sqrt{3}}{2}$$

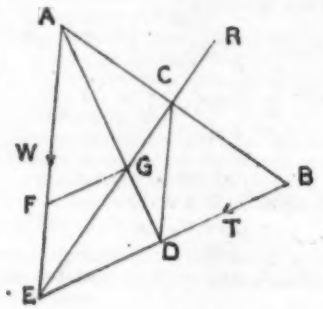
$$R\sqrt{3} = W \cdot \frac{\sqrt{3}}{2} - \frac{W}{2}$$

$$= \frac{W}{2}\left(\sqrt{3} - 1\right)$$

$$\therefore R = W\left(\frac{\sqrt{3} - 1}{2\sqrt{3}}\right)$$

$$= \frac{W}{6}\left(3 - \sqrt{3}\right).$$

2. HORATIUS.—AB is a weightless rod turning freely round its middle point C; D is a point vertically under C, such that CD equals half the length of the rod; the points B and D are connected by a thread of the same length as CD or CB; if a weight W is hung from A, what is the tension of the thread BD, and what is the magnitude and direction of the pressure on the point C?



Since CA = CB = CD, a semi-circle can be described about ADB, and the angle ADB is a right angle.

Since BD = CD = CB, then CDB is an equilateral triangle.

Since AE is parallel to CD,

$\therefore$ AEB is also an equilateral triangle, and C being the middle point of AB, EC is at right angles to AB.

Through C draw GF parallel to DE.

$\therefore$ By the converse of the triangle of forces

$$T : W : R = FG : FE : EG.$$

Let AB = BE = AE = $2a$.

Since D and C are the middle points of EB and AB respectively,

$$GE = \tfrac{1}{4}\,EC = \tfrac{1}{4}\sqrt{3}.a,$$

$$FG = \tfrac{1}{4}\,ED = \tfrac{1}{4}a,$$

$$\text{and } FE = \tfrac{1}{2}\,AE = \tfrac{1}{2}a;$$

$$\therefore T = W,$$

and R (which acts at right angles to AB) = $\sqrt{3}$ W.

3. IONA.—An excellent Botany is Thomé's (last edition), (Longman). D. Oliver's (Macmillan) might be enough for your purpose. Your second question would require a library and a lifetime. Begin with a simple book, say one of the Rev. J. G. Wood's.

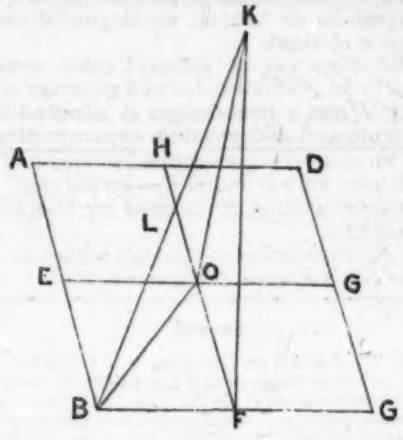
4. SELSEA BILL.—Write to J. Curwen, Tonic Sol-Fa College, London. You will receive all information.

5. NORTHERNER.—No; you cannot sit till 1891. A two years' interval must occur between the First and Second Year's Papers.

6. J. ROWLAND JONES.—*Se faire jour* is an idiom, meaning to make one's way, or cut one's way.

7. J. W. J.—(*British Guiana*).—The solution of your query appeared in our December issue.

8. RALPHO.—In a pyramidal pile of equal spheres on a square base, determine the tangent of the slope of a face and of an edge of the pyramid, the spheres being arranged in square order in horizontal layers. (*Intermediate Arts*, 1885.)



Let A, B, C, D, K be the centres of 5 balls at any of the angles: and let E, F, G, H be the points where the lower layer of balls are in contact, and L where the balls (whose centres are B and K) touch.

Join EG, HF intersecting in o.

Let r = radius of each ball.

$\therefore$ FO = EB = r, and BF = r,

$\therefore$ OB = $\sqrt{2} \cdot r$,

and BK = $2r$.

$$\therefore KO = \sqrt{4r - 2r}$$

$$= \sqrt{2} \cdot r.$$

$$\therefore \text{Tan KFO} = \frac{KO}{OF}$$

$$= \frac{\sqrt{2} \cdot r}{r}$$

$$= \sqrt{2}.$$

$$\text{Tan KBO} = \frac{KO}{OB}$$

$$= \frac{\sqrt{2} \cdot r}{\sqrt{2} \cdot r}$$

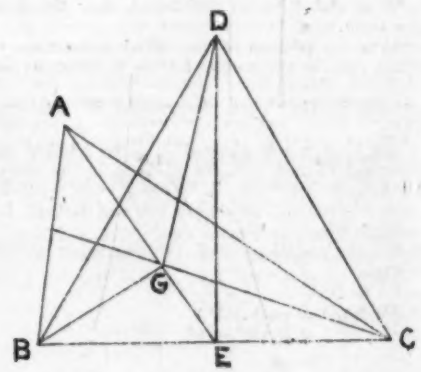
$$= 1.$$

Planes touching these spheres will be parallel to the lines KF, FO, and KB, BO.

$\therefore$ Tangent of the slope of a face = $\sqrt{2}$,

,, an edge of the pyramid = 1.

9. NEANDER.—Find the sine of the angle between two faces, and the sine of the angle between an edge and a face of a regular tetrahedron.



Let G be the point where AE (E middle point of BC) and FC (F middle point of AB) cut one another. Join DG.

Then DG is perpendicular to the plane ABC.

Let BC = $2a$,

Then BD = $2a$;

$\therefore$ AE = $\sqrt{3} \cdot a$ = DE,

and GE = $\frac{1}{2}\sqrt{3} \cdot a$.

$$\text{Cos DEG} = \frac{\text{GE}}{\text{DE}}$$

$$= \frac{a}{\sqrt{3}} \div \sqrt{3} \cdot a$$

$$= \tfrac{1}{3}.$$

$\therefore$ Sin DEG (angle between two faces) $= \sqrt{1 - \frac{1}{9}}$

$$= \sqrt{\tfrac{8}{9}}$$

$$= \frac{2\sqrt{2}}{3}.$$

$$\text{Cos DBG} = \frac{\text{BG}}{\text{DB}}$$

$$= \frac{2a}{\sqrt{3}} \div 2a$$

$$= \frac{1}{\sqrt{3}}.$$

$\therefore$ Sin DBG (angle between an edge and a face) $= \sqrt{1 - \frac{1}{3}}$

$$= \underline{\sqrt{\tfrac{2}{3}}}.$$

Arithmetic.

1. BLADENSBURGH.—If, when the duty on tea is raised from 13d. to 16d. per lb., the increase in the revenue is only 10 per cent., what is the decrease per cent. in the consumption?

(*Military Examination Paper.*)

Duty on 10 lbs. = 130d.;

Increase in revenue = 130d. + $\frac{3}{10}$ of 130d.

= 143d.;

Quantity for this duty = $\frac{130}{16}$ lbs.;

Decrease on 10 lbs. = 10 lbs. − $\frac{143}{16}$ lbs.

= $\frac{17}{16}$ lbs.

$\therefore$ Decrease in the consumption = ($\frac{17}{16}$ × 10) per cent.

= $\frac{85}{8}$ per cent.

= $\underline{10\frac{5}{8} \text{ per cent.}}$ Ans.

2. FOLKESTONIAN.—If 70 acres of wheat yielding 4 quarters per acre give a profit of £238, when wheat is 57 shillings per quarter, what profit will be made from 60 acres of wheat yielding 5 quarters per acre, when wheat is 55 shillings per quarter, the expense of cultivation being the same per acre in both cases?

Expenses of cultivation in first case

= (57s. × 70 × 4) − £238

= £798 − £238

= £560;

Expense per acre = £560 ÷ 70

= £8;

$\therefore$ Profit in second case = (55s. × 60 × 5) − (£8 × 60)

= £825 − £480

= $\underline{£345.}$ Ans.

3. REGINALD.—A railway carries first, second, and third class passengers between A and B. The fares were one year in the ratio of 7 : 5 : 4; the total number of passengers carried was 100,000, and the receipts £49,000. The next year the third class fare was reduced 25 per cent., and it was found that whilst the number of third class passengers increased 50 per cent., the second diminished 10 per cent., and the first 5 per cent., the number of passengers increased to 121,000, and the receipts to £49,300. Find the first, second, and third class fares, and the numbers of passengers during the first year.

(*Cambridge University.*)

No. 1st class + No. 2nd class + No. 3rd class = 100,000;

$\frac{19}{20}$ No. 1st + $\frac{9}{10}$ No. 2nd + $\frac{3}{4}$ No. 3rd = 121,000

19 No. 1st + 18 No. 2nd + 30 No. 3rd = 2,420,000;

But 19 No 1st + 19 No. 2nd + 19 No. 3rd = 1,900,000;

$\therefore$ 30 No. 3rd − 19 No. 3rd + 18 No. 2nd − 19 No. 2nd

= 2,420,000 − 1,900,000

11 No. 3rd − No. 2nd = 520,000.

(No. 1st × 1st fare in pounds) + (No. 2nd × $\frac{4}{5}$ of 1st fare in pounds) + (No. 3rd × $\frac{3}{4}$ 1st fare in pounds) = 49,000

(No. 1st + $\frac{4}{5}$ No. 2nd + $\frac{3}{4}$ No. 3rd) × 1st fare in pounds = 49,000;

($\frac{19}{20}$ No. 1st × 1st fare in pounds) + ($\frac{9}{10}$ No. 2nd × $\frac{4}{5}$ of first fare in pounds) + ($\frac{3}{4}$ No. 3rd × $\frac{3}{4}$ of $\frac{4}{7}$ of 1st fare in pounds) = 49,300

$\frac{19}{20}$ No. 1st + $\frac{9}{10}$ of $\frac{4}{5}$ No. 2nd + $\frac{3}{4}$ of $\frac{3}{7}$ No. 3rd) × 1st fare in pounds = 49,300;

By Division:—

$$\frac{\text{No. 1st} + \frac{4}{5}\text{ No. 2nd} + \frac{3}{7}\text{ No. 3rd}}{\frac{19}{20}\text{ No. 1st} + \frac{9}{14}\text{ No. 2nd} + \frac{9}{28}\text{ No. 3rd}} = \frac{490}{493}$$

$$\frac{140\text{ No. 1st} + 100\text{ No. 2nd} + 80\text{ No. 3rd}}{133\text{ No. 1st} + 90\text{ No. 2nd} + 90\text{ No. 3rd}} = \frac{490}{493}$$

(14 No. 1st + 10 No. 2nd + 8 No. 3rd) × 493 = (133 No. 1st + 90 No. 2nd + 90 No. 3rd) × 49

6,902 No. 1st + 4,930 No. 2nd + 3,944 No. 3rd = 6,517 No. 1st + 4,410 No. 2nd + 4,410 No. 3rd

(6,902 − 6,517) No. 1st + (4,930 − 4,410) No. 2nd + (3,944 − 4,410) No. 3rd = 0

385 No. 1st + 520 No. 2nd − 466 No. 3rd = 0;

But 385 No. 1st + 385 No. 2nd + 385 No. 3rd = 38,500,000;

$\therefore$ 385 No. 3rd + 466 No. 3rd + 385 No. 2nd − 520 No. 2nd = 38,500,000

851 No. 3rd − 135 No. 2nd = 38,500,000;

But 11 No. 3rd − No. 2nd = 520,000

Or 1,485 No. 3rd − 135 No. 2nd = 520,000 × 135

= 70,200,000;

$\therefore$ 1,485 No. 3rd − 851 No. 3rd = 70,200,000 − 38,500,000

634 No. 3rd = 31,700,000

$\therefore$ No. 3rd = 31,700,000 ÷ 634

= 50,000.

11 No. 3rd − No. 2nd = 520,000

$\therefore$ No. 2nd = 11 No. 3rd − 520,000

= 550,000 − 520,000

= 30,000.

$\therefore$ No. 1st = 100,000 − No. 2nd − No. 3rd

= 100,000 − 80,000

= 20,000.

Now, (No. 1st + $\frac{4}{5}$ No. 2nd + $\frac{3}{4}$ No. 3rd) × 1st class fare

= £49,000

(7 No. 1st + 5 No. 2nd + 4 No. 3rd) × 1st class fare = £343,000

(140,000 + 150,000 + 200,000) × 1st class fare = £343,000

(140 + 150 + 200) × 1st class fare = £343

490 times 1st class fare = £343

$\therefore$ First class fare = £$\frac{343}{490}$

= £$\frac{7}{10}$

= $\underline{14\text{s.}}$

Second class fare = $\frac{4}{5}$ of 14s. = $\underline{10\text{s.}}$

Third ,, = $\frac{4}{7}$ of 14s. = $\underline{8\text{s.}}$

Note.—Although Algebraical symbols have not been used, the above solution is by Algebraical methods. The pure Algebraical solution appeared in our issue for March, 1889, but you desired a solution by Arithmetic. This question was also set at the Matriculation Examination of the London University in June, 1883.

4. MARTHA.—A bankrupt has book-debts equal in amount to his liabilities, but on £6,000 of them he can only recover 13s. 4d. in the pound, and the expenses of the bankruptcy are 5 per cent. on the book-debts; if he can pay 13s. in the pound, what is the amount of his liabilities? (*Barnard Smith.*)

The expenses of bankruptcy are 5 per cent. on the book-debts. $\therefore$ Every pound is subject to a deduction of 1s. for expenses.

On £6,000 only 13s. 4d. in the pound is realised, and therefore only 12s. 4d. in the pound is available for the creditors. The creditors receive 13s. in the pound, and therefore (8d. × 6,000) or £200 is required from the other debts to make up this deficiency.

The other debts are paid in full, and therefore there is a balance of (19s. − 13s.) or 6s. on every pound of debt paid in full.

$$\therefore \underset{6}{s.} : \underset{\begin{array}{r}200\\20\end{array}}{\pounds} :: \underset{1}{\pounds} : \text{Amount of debts paid in full.}$$

$$\pounds 4000$$

$$\pounds 666\ 13s.\ 4d.$$

$\therefore$ Amount of liabilities = £6,666 13s. 4d. Ans.

5. OMICRON.—An income tax of 3 per cent. levied on 300,000 persons produces £5,400,000, and it is proposed to levy the tax on the surplus of all incomes above £150, instead of on the whole income: how much must the rate of the tax be raised that it may produce the same sum, and what incomes will be benefited by the change?

(*Lower Division Clerkship Examination Paper for* 1887.)

Total income = £5,400,000 × $\frac{100}{3}$
= £180,000,000,
Average income = £180,000,000 ÷ 300,000
= £600;
Average income for taxation after alteration = £600 − £150
= £450,

$\therefore$ Tax = 3 per cent. × $\frac{600}{450}$
= 3 per cent. × $\frac{4}{3}$
= 4 per cent.;
$\therefore$ Tax must be raised 1 per cent. Ans.

As amount of £150 is exempt from taxation, incomes below £150 + (£150 × 3), or £600, will be benefited by the change.

Algebra.

1. CYCLOPS.—Solve:—

$$\left.\begin{aligned} x^2 + y^2 + z^2 &= 50\\ yz + xy - zx &= 7\\ xy - yz - zx &= 47 \end{aligned}\right\}$$

(*Todhunter's* 'Algebra for Beginners.')

$$\left.\begin{aligned} (1)\quad x^2 + y^2 + z^2 &= 50\\ (2)\quad xy - xz + yz &= 7\\ (3)\quad xy - xz - yz &= 47 \end{aligned}\right\}$$

$$\left.\begin{aligned} (2)\quad xy - xz + yz &= 7\\ (3)\quad xy - xz - yz &= 47 \end{aligned}\right\}$$

Adding] $2xy - 2xz = 54.$ (4)

$$\left.\begin{aligned} (2)\quad xy - xz + yz &= 7\\ (3)\quad xy - xz - yz &= 47 \end{aligned}\right\}$$

Subtracting] $2yz = -40.$ (5)

Adding (1) and (4) and subtracting (5):—

$$x^2 + y^2 + z^2 + 2xy - 2xz - 2yz = 50 + 54 + 40 = 144$$
$$(x + y - z)^2 = 144$$
$$\therefore x + y - z = \pm 12. \quad (6)$$

Subtracting (4) and (5) from (1):—

$$x^2 + y^2 + z^2 - 2xy + 2xz - 2yz = 50 - 54 + 40 = 36$$
$$(x - y + z)^2 = 36$$
$$\therefore x - y + z = \pm 6. \quad (7)$$

$$\left.\begin{aligned} (6)\quad x + y - z &= \pm 12\\ (7)\quad x - y + z &= \pm 6 \end{aligned}\right\}$$

Adding] $2x = \pm 6$ or ± 18
$\therefore x = \pm 3$ or $\pm 9.$

(6) $x + y - z = \pm 12$
$y - z = \pm 9$ or ± 3

$$\left.\begin{aligned} \text{Squaring]}\quad & y^2 - 2yz + z^2 = 81 \text{ or } 9\\ \text{Multiplying (5) by 2]}\quad & -4yz = -80 \end{aligned}\right\}$$

Adding] $y^2 + 2yz + z^2 = 1$ or -71
$\therefore y + z = \pm 1$ or $\pm\sqrt{-71}.$

$\therefore$ Value $x = \pm 9$ is inapplicable.

$$\left.\begin{aligned} y + z &= \pm 1\\ y - z &= \pm 9 \end{aligned}\right\}$$
$$2y = \pm 10 \text{ or } \pm 8$$
$$\therefore y = \pm 5 \text{ or } \pm 4.$$
$$2z = \mp 8 \text{ or } \mp 10$$
$$\therefore z = \mp 4 \text{ or } \mp 5.$$
$$\therefore x = \pm 3, y = \pm 4, z = \mp 5;$$
or $x = \pm 3, y = \pm 5, z = \mp 4.$

Note.—You did not give the correct answers.

2. MADRAS STUDENT.—(1) Sum to n terms the series whose rth term is $2r - 1$.

(2) Sum to n terms the series whose mth term = $5 - \frac{m}{2}$.

(*Todhunter.*)

(1) Put $r = 1$,
Then 1st term = $(2 \times 1) - 1 = 1$;
Put $r = 2$,
Then 2nd term = $(2 \times 2) - 1 = 3$;
Put $r = 3$,
Then 3rd term = $(2 \times 3) - 1 = 5$;
We thus see that the difference is always 2, and that the first term is 1.

$$\therefore S = [2a + (n - 1)d]\frac{n}{2}$$
$$= [2 + 2(n - 1)]\frac{n}{2}$$
$$= (2 + 2n - 2) \times \frac{n}{2}$$
$$= 2n \times \frac{n}{2}$$
$$= n^2.$$

(2) Put $m = 1$,
Then 1st term = $5 - \frac{1}{2} = 4\frac{1}{2}$;
Put $m = 2$,
Then 2nd term = $5 - \frac{2}{2} = 4$;
Put $m = 3$,
Then 3rd term = $5 - \frac{3}{2} = 3\frac{1}{2}$;
We thus see that the difference is always $-\frac{1}{2}$, and that the first term is $4\frac{1}{2}$.

$$\therefore S = [2a + (n - 1)d]\frac{n}{2}$$
$$= \left\{(4\tfrac{1}{2} \times 2) + [(n - 1) \times -\tfrac{1}{2}]\right\}\frac{n}{2}$$
$$= (9 - \frac{n}{2} + \tfrac{1}{2})\frac{n}{2}$$
$$= \frac{19 - n}{2} \times \frac{n}{2}$$
$$= \frac{n}{4}(19 - n).$$

NOTE.—(1) We trust that the above complete explanations will remove all your difficulties in regard to these questions. Substitute the numbers 1, 2, 3, &c., for the term given.

(2) 'The Educational Times,'
Farringdon Street, London, E.C.

Mensuration.

1. INTER NOS.—A cylinder of metal (diameter of base 1 inch) is surrounded with another metal $\frac{1}{2}$ an inch thick. Suppose 2 inches of this cylinder were rolled out into a wire a mile long, and the other metal were removed by chemical action, what would be the diameter of the wire left?

(*Capel's* 'Catch Questions in Arithmetic and Mensuration.')

Cubic content of the part of original cylinder
= $[\pi \times (\frac{1}{2})^2 \times 2]$ cub. in.

To find out the thickness of this when rolled into one a mile long, we can ignore the outer coating altogether, as it cannot affect it.

Calling the diameter of the wire d in.,

$$\text{Cubic content} = \left[\pi \times \left(\frac{d}{2}\right)^2 \times 63{,}360\right] \text{cub. in.}$$

$$\therefore \pi \times \left(\frac{d}{2}\right)^2 \times 63{,}360 = \pi \times (\tfrac{1}{2})^2 \times 2$$

$$d^2 \times 15{,}840 = \tfrac{1}{2}$$

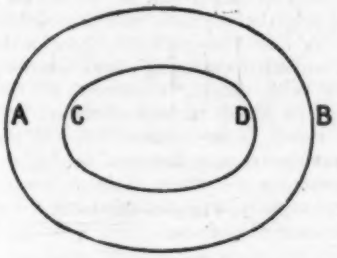
$$d^2 = \frac{1}{31680}$$

$$= \cdot 00003156$$

$$\therefore d = \sqrt{\cdot 00003156}$$

$$= \underline{\cdot 005618\ldots} \text{ in. Ans.}$$

A Correspondent has kindly sent us the following solution to No. 1, Mensuration, Fourth Year, Pupil Teacher Answers (see January, PRACTICAL TEACHER):—



Diameter of AB = (1,050 + 84) ft. = 1,134 ft. = 378 yds.
Radius of larger circle = $\frac{378}{2}$ = 189 yds.
Area of ,, = $(189)^2 \cdot \frac{22}{7}$ = 112,266 sq. yds.
Radius of island = 175 yds.
Area ,, = $(175)^2 \cdot \frac{22}{7}$ = 96,250 sq. yds.
Area of moat = 112,266 − 96,250 = 16,016 sq. yds.

$$\text{Cost} = £\frac{16{,}016 \times 5}{4 \times 20} = \underline{£1{,}001}. \text{ Ans.}$$

The question is so expressed as to be capable of being read in two ways. A *moat* cannot well be made *outside an island*. The solution in the January number is one answer, the present solution is the other.

Model Essays for Pupil Teachers.

BY C. J. DAWSON, B.A.,

Ex-President of the N.U.T.

XVI.

AMONG the best forms of composition in which students can exercise themselves, is the statement and exposition of some general truth or doctrine concerning intellectual life. Examples of this sort may be found in Lord Bacon's short essays and in the higher class of Magazines and Reviews. Among the subjects which may be chosen for practice, we may name Socialism, Competition, the Theory of Evolution, the Study of Nature. In dealing with such topics as these, it is not necessary for the essayist to take a particular side and argue against contrary views, though that is a possible and often a rather inviting mode of treatment. Still it is quite possible to set before one as an object only the clear statement of the idea or doctrine to be considered, with illustrations of its application and consequences.

No kind of essay affords wider scope for the introduction of results of reading, thought, and observation. None, perhaps, will better repay the trouble taken in preparation and composition. None will give better opportunities for cultivating an effective literary style. Subjects of the kind we have mentioned are often chosen for essays to be read before literary and scientific societies; and in such cases there is perhaps additional advantage to be derived from the discussion which usually takes place. Pupil teachers and other students might indeed find much profit in joining and taking an active part in some literary or debating society, where papers on various subjects are read and discussed by the members.

As a specimen essay of this class we present an exposition which we had the pleasure some time ago of delivering, in substance at least, but at somewhat greater length, as a paper to a local society of the mutual improvement type.

CULTURE: ITS MEANING AND VALUE.

In the first place, what is culture? The word has long existed, but the idea now coupled with it is essentially modern. Culture formerly had the same meaning as cultivation, or training of the mind, and was therefore a sort of synonym for education. Some years ago a short essay by an anonymous writer appeared in the *Cornhill Magazine*, under the heading 'The Modern Doctrine of Culture.' In this, culture was described as something which had been practised before, but was only just beginning 'to take definite shape as a doctrine.' It had not been strictly formulated, but seemed destined to become a striking addition to our intellectual forces. The writer said the doctrine had not an apostle, and did not admit of any clear definition. He described it, however, as throwing open a fresh department of behaviour, and instituting 'a higher branch of morals, in which the factors are, not justice and truth, but a set of æsthetic sensibilities.' The devotees of culture according to this writer were those persons whose chief desire was to attain by every available path pleasurable emotions,—for this end they read, travelled, studied science, and observed art.

Soon afterwards, Mr. Matthew Arnold—already known to fame as an eminent poet and a high-class critic—came forward to advocate and defend the doctrine of culture; and the earnestness and ability with which he championed his cause gained for him general recognition as the Apostle of Culture. His description of the doctrine differs widely, however, from that of the anonymous essayist. He 'recommends culture as the way out of our present difficulties; culture being a pursuit of our total perfection by means of getting to know, on all matters which concern us, the best which has been thought and said in this world, and through this knowledge turning a fresh and free stream of thought to play upon our stock notions and habits.' He repudiates Mr. John Bright's definition of culture as 'a smattering of Latin and Greek,' and he altogether disowns Mr. Frederic Harrison's description

of it as a sentimental fancy, fit only for a professor of *belles lettres*. Again and again he calls his culture the study of perfection—the disinterested endeavour after man's perfection; and he explains this true human perfection as a *harmonious* perfection developing all sides of our humanity, and as a *general* perfection developing all parts of our society. He points out how this perfection may be attained by reading, observing, and thinking. He evidently looks to literature as the great means of culture, and makes the remark that every day one lives 'one is more and more struck to find how much in our present society a man's life depends for its solidity and value on whether he reads during that day, and far more still on what he reads during it.' Newspapers he does not consider the likeliest helps to culture, but he adds, 'if with nothing but his letters and the newspapers a man gets a fresh and free play of the best thoughts on his stock notions and habits, he gets culture.' 'This inward operation is the very life and essence of culture.' In answer to the taunt that his doctrine is of no practical avail in the affairs and difficulties of life, he recalls what he had thought of as worthy mottoes of culture, first, Montesquieu's words, 'To render an intelligent being yet more intelligent,' and, second, Bishop Wilson's, 'To make reason and the will of God prevail;' for he proceeds to show that there is a higher manifestation of culture 'which moves by the force, not merely or primarily of the scientific passion for pure knowledge, but also of the moral and social passion for doing good.' In the following sentences he hints, rather than tells us, how culture is to help us in worldly difficulties:—'The idea of perfection as an *inward* condition of the mind and spirit is at variance with the mechanical and material civilisation in esteem with us; the idea of perfection as a *general* expansion of the human family is at variance with our strong individualism—our maxim, "every man for himself;" the idea of perfection as an *harmonious* expansion of human nature is at variance with our want of flexibility, our inaptitude for seeing more than one side of a thing—our intense energetic absorption in the particular pursuit we may happen to be following.' Quoting an expression from Swift's *Battle of the Books*—'the two noblest things, sweetness and light'—he adopts these as the names for the two chief characters of culture; 'sweetness, that is beauty and the love of it, light, that is intelligence and the desire to know the intelligible law of things. The ideal of perfection is that it is an inward spiritual activity, having for its characters increased sweetness, increased light, increased life, increased sympathy.'

If, in this attempt to represent the views of Mr. Arnold, the true spirit has been caught which dwells in his doctrine, it does not appear likely to call forth any of those shallow objections to which it was at first subjected, before he threw upon it the light of his clear exposition. It seems, indeed, that this doctrine of culture is something like an etherealised form of the teaching in the old rhyme, which tells us 'learning is better than house and land; for when land is gone and money spent, then learning is most excellent.' It may be noticed that as in the word learning, so in the word culture, there seems to be an almost unconscious change of meaning from the process—the operation—to the result attained. The advocate of culture practically says,—Store your mind with the best thoughts, meditate on these, and match your own acquired notions with them. So you will check hasty premature action, and instead of the dull routine of mechanical action, living forces will be brought into play. By this means it is believed that breadth of view will take the place of narrowness and one-sidedness, and correct what Mr. Arnold calls provinciality.

If we try to translate the technicalities of culture, sweetness and light, we may be able to describe the typical man of culture. As a general rule he has a good measure of ordinary education; his mind has undergone the discipline of learning the classical languages; he has a knowledges of some modern language; he is familiar with the best literature of our own country, is able to appreciate art in its various forms, and understands the public affairs of our own and of past times. To these acquirements in these days of scientific progress might well be added an acquaintance with some of the facts and principles of natural science. A man can scarcely agree with this description without possessing, and showing in his intercourse with others, refinement of manner and feeling, and an ability to look at things from various points of view. Some—almost any—of the features above enumerated may however be lacking and yet leave the essence of culture in the man; but without courtesy, sympathy, and thoughtfulness, culture can hardly be deemed to exist.

Here, perhaps, is the danger of exalting culture into a leading doctrine of social life. The mere outside polish and the more showy kind of mental acquirements may be too eagerly sought after, and a spurious culture may become common—a culture which leaves out the essence—the inward matching of thought with thought, the striving after perfection, and substitutes for the true sweetness a mere empty affectation of being familiar with everything that it is the proper thing to know. This, however, it will be understood is but a vain shadow of the culture Mr. Arnold preached.

There was, perhaps, one defect in Mr. Arnold's view of culture. It seems too exclusively directed to literature. From science he seemed to hold aloof, almost as if it were alien to culture. This was probably because his own mind lacked the scientific turn. Still, any feeling of antagonism to science could hardly be consistent with that desire for all-round development which was represented as of the essence of culture. At all events we shall not do wrong in recognising the study of science as an important element in general culture.

To sum up, we may safely arrive at the following conclusions. For our own help in secular matters, culture is a desirable object of pursuit. It is to be attained by the means of literary study and meditation. Science is also helpful, important, and indeed essential to its full attainment. Culture on its literary side, teaches us to reverence the past, to deal tenderly with the beautiful things of the earth. It should promote moderation and calmness of view. But it has some dangers,—one being a sort of lofty conceit, a serene way of looking down upon the doings of the uncultured. And it may fall into such a state as to justify in some measure the notions of those who imagine culture to be a sort of sentimental dreaming away of life in willing ignorance of the practical work of the world.

But while literary culture looks back, science looks forward; while the former rests and meditates, the latter moves and acts. And there are dangers on this side also. In science there is a tendency to proud boastfulness; it glories in its achievements; it anticipates a practical conquest of every force in nature, and is disposed to measure things too exclusively by their wealth-saving or wealth-producing power. And there is a further tendency to materialistic views: Science is prone to set up, as a rule, the impracticable precept, believe nothing that you cannot prove, and to boast of its denial of the spiritual essence in man's nature, with a foolish one-sidedness akin to that of the foxes who had lost their tails. Still we may trust that science and literature combined will help to correct each other's mischievous tendencies.

Culture may not be, as some would claim, a perfect substitute for experience; but true culture, all-roundness of development, will enable a man more readily to adapt himself to new circumstances, will help him to fit himself for duties hitherto unattempted, just as in a humbler sphere a sound education, a careful mental training of our young people, will fit them to enter with ease upon the practical work of their life.

Lastly, we must not forget nor undervalue that higher use of culture which specially affects the spiritual part of us, which enables us to turn aside from the din and confusion around us, and find a calmness and sweet reasonableness in the thoughts of the mighty dead, and inexhaustible stores of sweetness and light in the ever-varying scenes of nature and the wondrous and never-failing harmonies of her forces.

—o—

Publications Received.

BACON, G. W., & CO.—The Excelsior Combination Atlas for Standard VI.; The Excelsior Maps of Canaan and Palestine.

BELL, G., & SONS.—The School Calendar, 1890.

BLACKIE & SONS.—Elementary Text Books: Elementary Mechanics, Part II.

CHAPMAN & HALL.—Alternative Elementary Physics (*Mills*); Handbook of Quantitative Analysis (*Mills and North*); Solutions to Questions in Pure Mathematics, Stages 1 and 2., Science and Art (*Rankin*); Perspective Charts for use in Class Teaching (*James*).

CLAY, C. J., & SONS.—The smaller Cambridge Bible for Schools: Samuel I., Samuel II. (*Kirkpatrick*); St. Matthew (*Carr*); Pitt Press Series: A Short History of British India (*Carlos*); Atlas of Commercial Geography (*J. G. Bartholomew and Dr. Hugh Robert Mill*).

CLIVE, W. B., & CO.—Univ. Corr. Coll. Tutorial Series—Livy Book XXI. (*Allcroft and Masom*).

DEAN & SON.—History of France (*Corner*).

FISHER UNWIN, T.—The Century magazine: January and February; The Story of the Nations: The Barbary Corsairs (*Stanley Lane-Poole*); Revue Bleue; Revue Scientifique.

HEYWOOD, JOHN.—Andersen's Fairy Tales and Stories.

LONGMANS & CO.—Warren's Table and Formula Book.

MACMILLAN & CO.—Yeast (*Charles Kingsley*); Arithmetic for Beginners (*Brooksmiths*); Cæsar, Gallic War, VI. (*Colbeck*).

MISCELLANEOUS.—Gibson's Inspectors' Physiology Questions, Stage I.; Parallel Translations of Lines and Surfaces (*Maver*).

NELSON, T., & SONS.—Pictures of the Childhood of Jesus; The Royal English Classics: Macaulay, Milton, Cowper, and Goldsmith.

OLIVER & BOYD.—School Geography (*Clyde*); Geometry for Schools (*Barclay*).

PHILIP G., & SON.—The Educational Annual, 1890.

PITMAN, J., & SONS.—Charles Dickens's Pickwick Papers in Phonography, Vols. 1 and 2.

RELFE BROS.—The Modern Language Examiner (*Roux*); Practical Exercises in Commercial French (*Bayles*).

SMITH, ELDER, & CO.—The Cornhill Magazine: February.

WARD, LOCK & CO.—Lippincott's Magazine: February.

WILLIAMS & NORGATE.—Victor Hugo's Les Miserables, Vols. 1 and 2 (*Boïelle*); Victor Hugo's Notre Dame, Vols. 1 and 2 (*Boïelle*); Macaulay, Vols. 1 and 2 (*Boïelle*); French Composition (*Delbos*); French for Beginners (*Lemaistre*).

—o—

Publications Reviewed.

An Elementary Text-book of Geology. By W. Jerome Harrison, F.G.S. London: Blackie and Son.

The Senior Demonstrator of the Birmingham School Board, and the author of this work, truly remarks, that although geology 'cannot be learnt from books,' it is equally true that 'geology cannot be learnt *without* books.' He has therefore produced a work intended as an introduction to the study of the rocks and their contents. Dealing first with descriptive geology, the author passes to the classification of animal and vegetable life, and finally to historical or stratigraphical geology. There are 106 illustrations given, but many of them could be replaced by others with advantage. Thus, a series of imaginary scenes during different epochs teaches little, and it would have been more practical if some geological sections were inserted instead. The dyke of igneous rock figured on page 53 appears to us to be more picturesque than real, and the section across the Jura mountains has been proved to be entirely incorrect. It might also be pointed out that marl is not clay mixed with lime (CaO), but with limestone or chalk ($CaCO_3$). These are only, however, a few minor faults, and do not seriously detract from the value of what is, on the whole, a fairly good specimen of an examination text-book.

Reporting Hints and Practice. By Alfred Baker. London: Isaac Pitman and Sons.

This book is 'designed for student-reporters and others qualifying for newspaper work.' It is not a book on shorthand, nor is any part of it printed in shorthand. It is rather a series of papers, setting forth useful practical suggestions on the various departments of a reporter's work, and at the same time supplying an admirable course of exercises for practice. The papers are twenty-six in number, and treat of such subjects as paragraph-writing, public meetings, company meetings, political speeches, discussions, dinners, law cases, sermons, lectures, pastimes, interviewing and many others. In each paper, after some remarks and advice on the nature of the particular kind of work, an example of a report is given, in most cases, from some leading newspaper. All the chapters are made available for practice by an ingenious plan of numbering the words. At the end of each hundred words from the beginning of the paper is placed 100, 200, 300, as the case may be, in a form like that of an algebraical index. By means of these marks a student can easily test his speed in copying, or writing to dictation. Some ingenuity must have been exercised by the author in making so many of the paragraphs of hints number exactly two hundred words. Mr. Baker says that 'Phonography is the system in general use among reporters,' and 'his experience in note-taking has shown him the immense superiority of Mr. Pitman's system, especially in all difficult kinds of work.' In an appendix he gives some suggestions on 'the preparation of copy'—an important part of the reporter's duties. The book is neatly got-up.

National Phonographic Library: A Christmas Carol. By Charles Dickens. London: Isaac Pitman and Sons.

Following up their rational plan of surrounding the study of Phonography with living interest, the publishers have added to their Phonographic Library a seasonable production—Dickens's Christmas Carol. It is beautifully printed in the 'reporting style' from lithographed plates by James Butterworth. It will afford useful and interesting reading practice for any would-be reporter, and at the same time set before him a high ideal of the style at which he should aim.

Pitt Press Series: A Short History of British India. By E. S. Carlos, M.A. Cambridge University Press.

The author has aimed in this work at 'giving a complete outline of the circumstances which have produced the present political and social condition of India.' He appears to us to have succeeded well in attaining this object. In a clear and succinct manner he traces the growth of British rule in India, and the narrative concludes with the expression of what seem to be well-grounded hopes for a prosperous future for the vast empire which has been so continuously built up, so rapidly developed, and so greatly influenced within the last century or so. An introduction gives a concise key to the spelling and pronunciation of Indian names, and a list is added of the authorities on which the book is based, and to which the student may refer for further details on the various subjects treated. The study of this short history itself can scarcely fail to promote accurate knowledge respecting our great eastern dependency, and to stimulate interest in its eventful annals.

The Elements of Physiography, Part I. By By John J. Prince. Seventh edition. London and Manchester: John Heywood.

This is an enlarged edition of a cheap work issued for the purpose of guiding students of elementary physiography who intend sitting at the May examination. It is, however, somewhat to be regretted that the author has not included in this edition some portions of physiographical science now deemed indispensable by the examiners in the subject at South Kensington, *e.g.*, the principles and the construction of a simple astronomical telescope; and again, nothing is said concerning the apparent paths of the stars across the sky when observed in different latitudes. But it is not so much with the omissions committed that we have to deal as to point out some serious errors perpetrated. To assert that *the earth is spherical in its form* because a vessel sailing away from the land gradually sinks out of sight is, to say the least, misleading. The illustration only proves that the earth is not flat. Under volcanoes, we find it stated that they eject 'fragments of solid rock as cinders and ashes and *sometimes* steam.' Such a description does not discriminate sufficiently between scoriæ and cinders as generally understood, and relegates steam, by far the most important product of all eruptions, to a very secondary place.

We might also point out that nothing could be more incorrect than to say, 'Each ray proceeding from the sun consists of two distinct parts, the one producing light, the other heat.' The correlation of light and heat cannot be too strongly insisted upon in the most elementary treatise and we are sorry the author should have overlooked such misleading statements in his revision.

Owing to the great pressure on our space this month we are compelled to hold over until next issue, 'Model Answers to Certificate Questions,' as well as several Reviews.

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